

2015 Dietary Guidelines Advisory Committee Meeting 7

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Meeting Summary

Participants

Dietary Guidelines Advisory Committee (DGAC): Dr. Barbara Millen (Chair), Dr. Alice H. Lichtenstein (Vice-Chair), Dr. Steven Abrams, Dr. Lucile Adams-Campbell, Dr. Cheryl Anderson, Dr. J. Thomas Brenna, Dr. Wayne Campbell, Dr. Steven Clinton, Dr. Frank Hu, Dr. Miriam Nelson, Dr. Marian Neuhouser, Dr. Rafael Pérez-Escamilla, Dr. Mary Story

Co-Executive Secretaries: Dr. Richard Olson, Ms. Colette Rihane, Dr. Kellie O. Casavale, Dr. Shanthy Bowman

Others: Mr. Kevin Concannon, Dr. Wanda K. Jones, Ms. Angela Tagtow

Opening Remarks

Dr. Richard Olson, Designated Federal Officer, Division of Prevention Science, Office of Disease Prevention and Health Promotion, U.S. Department of Health and Human Services welcomed the Committee to the seventh and final DGAC meeting and acknowledged the substantial amount of work accomplished in the last nineteen months. All of the members are in attendance except for Dr. Anna Maria Siega-Riz. Dr. Frank Hu will be leaving at 4:30 p.m. The Committee will be presenting their major conclusions and recommendations today. These will go into the final report that will be submitted to the Secretaries of HHS and USDA. This is the last meeting, so it is very important that if there are any issues that need to be resolved, they need to be discussed today. Minor edits can be sent to Dr. Barbara Millen and Dr. Alice H. Lichtenstein for approval before they sign off on the report that will be submitted to the Secretaries. Today's agenda will include introductory remarks and presentations from each of the five subcommittees as well as on cross-cutting topics, physical activity, and the integration of all of the chapters. For those on the webcast, the video of the day should be posted online by the end of the week.

Dr. Olson then introduced **Dr. Wanda Jones, Principle Deputy Assistant Secretary for Health at the Department of Health and Human Services.**

Dr. Wanda K. Jones thanked Dr. Olson and said the process has been quite a ride and an adventure. The span of topics covered as an Advisory Committee is mind-boggling. One of the great duties as citizens in this country is to participate as part of the government. As a scientist and citizen, when the Committee members have an opportunity to be called like this to serve and give specific advice, what a difference it makes for all to do better work. Dr. Jones thanked the Committee. Dr. Jones said the Acting Assistant Secretary for Health, Dr. Karen De Salvo, will be here later today. Exciting times are to come. The work may be concluding as an Advisory Committee but the work for HHS and USDA is beginning. This has been a full and outstanding partnership with the Advisory Committee and the HHS and USDA colleagues. Dr. Jones said the Committee's work and interest to advance public health are invaluable to HHS and USDA. It has been a great partnership working with USDA seamlessly and supporting each other. Dr. Jones thanked Under Secretary Concannon and said the Committee's work has unfolded at an admirable pace. The volume and depth of information that the Committee reviewed allowed it to really hone in on the key elements and key issues towards updating the *Dietary Guidelines* and has really reflected the Committee's determination, scientific expertise, public health commitment, and tenacity. Watching this unfold has been phenomenal.

Dr. Jones said disease prevention and health promotion are HHS's top priorities. The *Dietary Guidelines* for 2015 will be a key tool for HHS to reach toward the American public to help them understand what it means to engage in healthy eating patterns. The *Guidelines* will show what schools and Federal nutrition programs can do to bolster the quality of the food served and will show in many different ways how to support the Departments' and the Federal Government's efforts to protect and improve the health of Americans. Based on the accumulated evidence that is in the report, the two departments, HHS and USDA, will aim to develop a new edition of the *Dietary Guidelines* that will empower Americans to make healthier choices and foster environments that help make those choices more prominent.

The new *Guidelines* should launch late this year and will be used as a platform to develop and roll out some easy-to-understand information and evidence-based tools and resources to help people everywhere in this nation build healthy eating patterns and lifestyles to help live longer and healthier lives. Mr. Kevin Concannon will speak shortly, and with USDA's continued collaboration in this effort, focusing on areas that will make the biggest difference in public health is going to be life changing for many. Although HHS and USDA work in different areas in public health, the departments share a common mission and that is helping Americans to achieve the highest attainable standard. The Committee's enthusiasm for helping people of this great nation to live healthier and longer lives has energized and inspired all to work even harder toward the shared goal. An African proverb that sums this up well is, "If you want to go fast, go

alone. If you want to go far, go together.” That has been the story of this Committee and its tireless work, with the longstanding collaboration with HHS and USDA. On behalf of everyone at the Department, Dr. Jones thanked the Committee for its hard work, its commitment to improve public health, for volunteering time the past eighteen months, for insightful knowledge, for thoughtful review of the evidence, and for work that will help insure a healthier nation.

Ms. Angela Tagtow, Executive Director, USDA’s Center for Nutrition Policy and Promotion (CNPP), spoke next and said that since joining USDA five months ago, this is her first opportunity to speak with all of the Committee and that it is truly an honor. As with CNPP’s partners at HHS, the Center is very grateful to this Committee for dedication to advancing public health and for tireless work that culminates with recommendations to USDA and HHS. CNPP looks forward to the final report and for passing the torch to work on the policy, the *2015 Dietary Guidelines for Americans*. The significance of the *Guidelines* cannot be underestimated. The Center is grateful and appreciates the gravity of the responsibility that has rested on the Committee members’ shoulders for the last eighteen months as it has reviewed the most robust and current science and formulated its recommendations.

Ms. Tagtow extended a sincere appreciation to the well-oiled team of ODPHP and CNPP for the unwavering support provided to the Committee. Unfortunately, the nation is still not eating according to the *Dietary Guidelines*, as evidenced by the continued increase in diet-related chronic diseases in this country. CNPP takes responsibility for developing the *2015 Dietary Guidelines for Americans* very seriously. The work simply does not end with the *Guidelines*. CNPP will drive robust efforts in consumer education and much more to bring the *2015 Dietary Guidelines* to life in very actionable and engaging ways. CNPP cannot do this alone. Ms. Tagtow asked that the Committee continue to stay as engaged as it can and to support these efforts within its own channels. CNPP will be making “the ask” across all sectors and industries because that is what it takes to make a real impact, to reach a point when the nation is finally eating according to the *Dietary Guidelines* and as a result bringing about lasting positive changes. Ms. Tagtow again thanked the Committee for its commitment to this initiative.

Ms. Tagtow then introduced the next speaker, Kevin Concannon. The Under Secretary was confirmed by the Senate in July 2009 to serve as the Under Secretary for Food, Nutrition, and Consumer Services at USDA. He oversees the Center for Nutrition Policy and Promotion and the Food and Nutrition Service. Those programs serve about one in every four Americans through the Supplemental Nutrition Assistance Program known as SNAP; the National School Lunch, the School Breakfast, and Summer Food Service Programs; the Special Supplemental Nutrition Program for Women, Infants and Children; the Child and Adult Care Food Program; and many more. The Under Secretary has had a lengthy and distinguished career in public service, including in Ms. Tagtow’s home state of Iowa. Over the past 25 years, Mr. Concannon has

championed expanded services, improved access to consumer choices, and affordable health care.

Mr. Kevin Concannon, Under Secretary for Food, Nutrition, and Consumer Services (FNCS), USDA, thanked Ms. Tagtow and said it is a pleasure to be here and that it does not seem like that long ago that the Committee began its work. It is historically important that it gathered for its seventh meeting within hours of the United States Congress passing what has been called the CR omnibus bill, which will give direction of certain kinds. Nutrition and diet issues have certainly risen in importance, in particular, the Women, Infants, and Children and the school nutrition programs. Some of what gets into bills like this has more to do with political science than nutrition or health science. It is necessary to go back through that bill today to see what the implications are for children and pregnant women, in the case of the WIC program, across the country.

Mr. Concannon channeled Dr. Jones' words of thanks and added that Dr. Catherine Woteki, Chief Science Officer at USDA, would not be able to join the Committee today. Dr. Woteki is committed to two meetings and could not physically make it to Bethesda but asked that deep appreciation for the Committee's work be conveyed. As Dr. Jones mentioned, USDA also appreciates the partnership with the Committee, as well as with the staff at the Department of Health and Human Services.

Mr. Concannon was kept apprised of the Committee's work over the past eighteen months. It did a tremendous job of prioritizing the issues in the vast body of nutrition science and framing these issues with behavioral and public health support. The volume of evidence collected and analyzed is tremendous and will help not only with the development of the *2015 Dietary Guidelines* but also will lay groundwork for years beyond that. Mr. Concannon said the Committee met the challenges along the way with the utmost scientific and professional integrity. All look forward to hearing the final conclusions and considering how to best implement recommendations in national policy.

Mr. Concannon then reflected on the *Dietary Guidelines'* impact within USDA FNCS programs and initiatives which directly impact tens of millions of Americans. Mr. Concannon spent last week in California and met with a number of nutritionists engaged in the Women, Infants, and Children program and school programs and met with public health officials from the state. The *Dietary Guidelines* gets translated into day-to-day action and affects the quality of life of millions of Americans. Mr. Concannon restated the importance of the Committee's work. The School Nutrition Act, a product of the Healthy Hunger-Free Kids Act of 2010, is making a difference in the lives of millions of American children. Each day, over 50 million school-aged children attend schools across the U.S. and now have access to a healthier environment. Each and every day, 30 million of those students consume a school lunch; 13.5 million have school

breakfast based on the *Dietary Guidelines, 2010*. Updated meal standards will soon be released for childcare homes and childcare centers that participate in the CACFP program. Healthier eating among food stamp participants is encouraged; over 46 million participate in that program each month. Each month, over eight million women, infants, and children receive monthly supplemental food packages that are based on the *Dietary Guidelines* recommendations, ensuring that America's infants, young children, and expectant or new mothers receive essential foods and nutrients through the WIC program. The Committee's professional integrity has been relied on in USDA's dialog back and forth with Congress and others to assure that pregnant women, very young children, and infants receive access to healthy food consistently through the respective Federal and State programs.

The *Guidelines* serve as the basis for consumer information such as MyPlate and the SuperTracker. The MyPlate icon has resonated with consumers and it continues to be the most public face of the Dietary Guidelines Advisory Committee's recommendations with print and online materials. Since the launch, choosemyplate.gov has received over 240 million page views and this year alone, close to 50 million downloads. The SuperTracker, CNPP's online diet and nutrition tracking tool, has been a way to bring the *Dietary Guidelines* to life to consumers by helping them see where more work is needed to meet the recommendations. Currently, the SuperTracker has 4,000,699 users. Although this is not a comprehensive list, it shows how the *Dietary Guidelines* play a role in the work of both agencies, USDA and HHS, and it extends across the network of Federal programs.

The *Dietary Guidelines for Americans* is the handbook for nutrition policy for prevention. Mr. Concannon thanked the Committee for its tireless efforts and for all of the work accomplished in the last eighteen months. All look forward to receiving the Committee's report; then work begins at an even more intense pace, but with confidence, thanks to the great work that the Committee has done.

Integration of Findings

Dr. Barbara Millen, Chair of the DGAC, thanked the Under Secretary, Principal Deputy Assistant Secretary, USDA and HHS colleagues and staff, and members of the Committee for the tremendous effort on behalf of the 2015 Dietary Guidelines Advisory Committee. Dr. Millen thanked speakers for the opening remarks, setting the stage for the Committee presentations, and highlighting the potential impact of the work of this Committee. Dr. Millen shared that it was a delight to be at the final meeting and was very proud of the scope that has been handled and also the evidence that the Committee is here to present.

Dr. Millen provided an introduction to the Dietary Guidelines Advisory Committee Report and introduced the Committee's conceptual model. The model keys off of the socio-ecological

model, a well-established conceptual framework in the public health field which was used in the *2010 Dietary Guidelines*. As previously reported, the 2015 DGAC conceptual model captures the scope of work and served as a guide to the research and report. The model is titled “Diet and Physical Activity, Health Promotion and Disease Prevention at Individual and Population Levels Across the Lifespan.” The DGAC recognizes that a dynamic interplay exists among individuals’ nutrition, physical activity, and other health-related lifestyle behaviors and complex personal, social and environmental contexts. The figure shows how these personal, social, organizational, and environmental contexts and systems interact powerfully to influence diet and physical activity behaviors and patterns of individuals and how wide-ranging health outcomes result from this dynamic interplay.

An accompanying table in the report expands on the figure by identifying specific factors that comprise each of the “Determinants” and “Outcomes” circles. The table distinguishes those factors that are addressed in the DGAC report from related factors that are important but beyond the scope of the report. Only the factors represented in the model that are addressed in the report will be discussed today.

The central portion of the conceptual model represents the concept that the combination of a healthy diet and regular physical activity behaviors and patterns is central to promoting overall health and preventing many chronic diseases and other lifestyle-related diseases. There are influences and determinants of these patterns and behaviors that in turn lead to their impact on health outcomes.

Represented in the individual and biological factors portion of the model, the DGAC considered the following: 1) Biological factors: physical and cognitive function; clinical health and nutritional status profile; weight status; 2) Nutrition, physical activity and health-related factors: food label use, dietary or physical activity self-monitoring; personal lifestyle profile including diet, physical activity and lifestyle behaviors and practices; and 3) Demographics: age, gender, race/ethnicity, acculturation, income, geography/region, and urban/rural location of residence.

Dr. Millen described the household/social and cultural factors portion of the model such as structure, resources, values, and norms that influence lifestyle behaviors. The Committee considered: 1) Family/household/home: parenting and lifestyle behavioral modeling; food and beverage availability; home cooking and storage facilities; family shared meals and physical activity resources in the home environment; and 2) Social/cultural/religious/peer networks: engagement of the community and participation in lifestyle and health-related programs and initiatives.

Dr. Millen described the community and environmental factor section of the conceptual model. The Committee considered: 1) Food and physical activity: types of available retail food outlets,

restaurants, food banks, and farmers' markets; safety, quality and sustainability of available food supplies; patterns of food waste; 2) Community: neighborhood food access, child care, schools, and worksite settings; 3) Business/Workplace: corporate/worksite wellness policies and programs; the availability of nutrition, exercise, and health services programs and resources; 4) Healthcare and public health: providers and programs that engage in lifestyle behavior change, health promotion and disease prevention; accessibility of clinical preventive services including nutrition counseling and comprehensive lifestyle interventions; and 5) Ecosystems (national to global): the natural environment, including farmland; plant, animal, marine, land, and water ecosystems; renewable energy resources; land/water/air and soil environments and quality; plant conservation, biodiversity; greenhouse gas emissions, pollution/contamination.

Dr. Millen shared the systems and sectors of the conceptual model that influence food availability and diet and physical activity behavior. The Committee considered influences of the: 1) Food, beverage and agriculture industries: in addition to topics already mentioned, the Committee considered safety of caffeine and aspartame, and seafood supplies; 2) Economy: individual and household income; and 3) Technology, such as mHealth.

Dr. Millen shifted the discussion to the health outcomes section of the model. The Committee considered many ways in which dietary patterns and physical activity impact health. Represented in the model are the dimensions of healthy nutritional status including: knowledge, behaviors, and perceptions of security and risk factor profiles. The Committee focused on the following outcomes: 1) Dietary patterns: habitual food and nutrient consumption; overall dietary quality and variety; 2) Food, beverage and nutrition intake: foods/food groups, beverages (including alcohol), and macro- and micronutrients, nutrients of concern and public health significance; 3) Dietary product and nutrient supplement use; 4) Food and nutrition knowledge, attitudes and skills: food preparation, cooking and nutrition knowledge, attitudes and skills; 5) Food security and safety: selection, storage, handling, and preparation of foods and beverages; and 6) Risk factors and clinical indicators: iron and protein status, vitamin D and folate levels, Vitamin B12 status, hemoglobin A1c; metabolic syndrome (blood lipids and glucose, blood pressure); bone density.

For the outcome physical fitness and function the Committee examined: 1) Physical activity patterns and behaviors: aerobic and strengthening activities; occupational, work, and leisure time activity; and 2) Sedentary behaviors and sleep patterns: screen time and other sedentary behaviors.

Dr. Millen next described health outcomes influenced by diet and physical activity behaviors. The DGAC examined the following: cardiovascular diseases (CVD) (coronary heart disease, heart attack, hypertension and stroke); type 2 diabetes; and diet-related cancers (breast, colorectal, prostate, lung).

The Committee also examined other diet-related health outcomes: neurological and psychological conditions and mental health (including cognitive function, dementia, Alzheimer's disease and depression); dental caries; congenital anomalies; musculoskeletal and bone health (fractures and osteoporosis); gastrointestinal health; and total mortality.

Overweight and obesity are so important and prevalent that the Committee made it a separate outcome. The Committee examined weight and body composition outcomes including: childhood and adolescence length/height, weight and Z scores, body weight and weight gain, BMI, waist circumference, abdominal obesity, lean and body fat mass; and overweight and obesity.

The Committee took a life course approach and considered pregnancy course and outcomes; child and adolescent growth and development milestones; peri- and post-menopause; and younger and older adulthood.

Building on this model, the Science Review Subcommittee that provides guidance on the overall scientific process and five topic-specific subcommittees reviewed the evidence and synthesized recommendations that have been deliberated on by the full DGAC at the previous six public meetings and in the seventh and final meeting today, during which final deliberations will be made.

Subcommittee (SC) 1 gathered data and trends to answer questions on the current adequacy and quality of the American population's food and nutrient intake, dietary patterns, and health. These findings provide important perspectives and context for the other subcommittees and the 2015 DGAC recommendations. SC 1's data comprise a very traditional area of DGAC focus, but the Committee expanded on nutrition-related health outcomes and evaluated dietary patterns in novel ways.

SC 2, by far the largest SC, also has been focused on more traditional DGAC issues, that is, the relationship between diet and major and less common health outcomes. However, its approach differed in a key way from past DGACs in that it focused mainly on dietary patterns rather than primarily on single foods or food groups or single nutrients of interest. Dietary patterns are examined using adherence scores as well as relative population subgroup food and nutrient consumption. Among the dietary patterns examined were the USDA Food Pattern (Healthy Eating Index and its alternatives), the Mediterranean-style diet (scores and patterns), the Dietary Approaches to Stop Hypertension (DASH)-style diet and its modifications, and vegetarian patterns.

The DGAC has taken this tack because of the abundance of new research on the relationships between dietary patterns and health outcomes and current research into the best methods, modes, and settings in which to achieve dietary behavior change for improved individual and population health.

SC 3 is evaluating “what works” in helping Americans make better eating and physical activity choices at the individual, family, and small group levels, as well as the barriers and motivators of diet and physical activity behavior change. The DGAC wants to help and inspire people to adopt healthy lifestyles, not just provide recommendations on what should be done.

SC 4 is evaluating community and population level strategies and environmental barriers to and facilitators of a healthy lifestyle. The examination of environmental influences on population behaviors adds a public health focus to the DGAC’s work. SC 4 is exploring the characteristics of neighborhoods that promote diet and physical activity behaviors, as well as other environments such as early childcare settings, schools, worksites, and other locations and frameworks (such as federal food and nutrition assistance programs). They are looking into how these and other ‘environments’ 1) Provide access to quality foods and nutrition services; 2) Increase the population’s understanding of the importance of healthy lifestyle behaviors; and 3) Promote the adoption and maintenance of healthy choices for health promotion and disease prevention.

Finally, SC 5 is updating the guidance on food safety behaviors for the prevention of foodborne illness. They are also addressing a few specific food safety areas, such as the safety of usual and high dose caffeine and aspartame. They are evaluating relationships between dietary patterns and sustainability of a healthy diet and reducing population risks for food insecurity now and for future generations.

Working or writing groups were established to bring together questions originally proposed by more than one of the five subcommittees to consider those questions in a coordinated, comprehensive and coherent way. This afternoon the Added Sugars, Sodium, and Saturated Fats Working Groups will present on work that has culminated in a chapter for the final report entitled “Cross-cutting Topics of Public Health Importance.” The Physical Activity Writing Group will summarize its chapter also.

As reported previously, for the benefit of the public, subcommittees utilized two types of outside experts: invited experts and consultants. Invited experts were individuals invited by a subcommittee, usually on a one-time basis, to provide expertise to inform the subcommittee’s work. Invited experts do not participate in decisions at the subcommittee level. The five topic area subcommittees have not had any additional invited experts since our last meeting in November. On the topic of health care in the U.S., a cross-cutting group of DGAC members did

hear a presentation from Dawn Alley and Catherine Oakar, who are Federal experts on the topic. This expertise informed the Committee on context for the systems approach to health in the U.S.

Then there is the second category, that of consultants. These individuals participated in discussions and decisions on an ongoing basis but were not members of the full DGAC or involved in decisions at the full Committee level. Like DGAC members though, consultants completed training and had been reviewed and cleared through a formal process within the Federal government.

In terms of our scientific process, as reported at previous meetings, evidence was examined using NEL systematic reviews (USDA Nutrition Evidence Library), existing high-quality evidence-based reports, original data analyses (USDA, CDC, other offices), and/or food pattern modeling analyses (USDA). Additional sources of information may include written comments from the public. The Committee truly appreciates the time and information provided from the public over the past 18 months.

Systematic reviews through the USDA Nutrition Evidence Library use a six-step process. Details related to USDA's methodology can be found on the NEL website, NEL.gov. Dr. Millen reviewed these six steps. First, topics and research questions are identified by each subcommittee. In step two, for each systematic review question, a literature search protocol is defined to guide literature screening and selection. Then, in step three, for each included study, key information is extracted and rated using predefined criteria for risk of bias. In step four, the complete body of evidence is described and qualitatively synthesized. Then, in step five, the Committee develops and grades conclusion statements and develops implications and recommendations for each review question. In the final step six, research recommendations are developed. It is important to note that the Committee members took the lead on the systematic reviews and made all substantive decisions while the NEL staff supported the members' needs.

Dr. Millen shared more information about conclusion statements, grading, and implications statements which are important pieces found within the report. The conclusion statement is a concise answer to the scientific research question and conveys the 'strength of the evidence'. Grading considers multiple dimensions of the quality of scientific evidence. Conclusion statements include one of four strength-of-evidence grades: strong, moderate, limited, or grade not assignable. In grading the evidence, the Committee utilizes predetermined criteria to rate the quality of the research. For example, a 'strong' evidence grade indicates that the conclusion statement is supported by a large, high quality, and/or consistent body of evidence that directly addresses the question. There is a high level of certainty that the conclusion is generalizable to the population of interest, and it is unlikely to change if new evidence emerges.

Because the conclusion statement is a direct answer to the scientific question posed, it is necessary to develop an implications statement that follows the conclusion statement. The implications statement puts the conclusion in the necessary context to describe what the Committee recommends that Americans and those who serve them in various settings do to promote health and prevent disease.

Dr. Millen stated that the DGAC's recommendations are advisory and are not, in themselves, Federal policy. The report will be used by HHS and USDA as the science base to develop the *Dietary Guidelines for Americans* policy in 2015.

Today the Committee will present the themes of these evidence reviews and will note where the strongest evidence exists to make recommendations. It will be articulated where consistency across conclusions can be synthesized to harmonize recommendations. Conclusions will be put into the needed context to be considered for developing future policy through our implications statements.

This final meeting provides the last opportunity for the Committee as a whole to reach consensus on the content, which will be put forward in a final report. At the end of the day there will be an opportunity for a general, "All in favor, say aye," to get a consensus on the report. Presentations will go in subcommittee order, followed by the cross-cutting topics. Finally, integration of findings will be presented.

Dr. Millen then turned the floor over to the Chair of SC 1, Dr. Marian Neuhouser.

Subcommittee 1 (SC 1): Food and Nutrient Intakes and Health: Current Status and Trends

Dr. Marian Neuhouser, SC 1 Chair, identified the members of SC 1, who are Dr. Steven Abrams, Dr. Cheryl Anderson, Dr. Alice H. Lichtenstein, and Dr. Mary Story, and introduced the chapter "Food and Nutrient Intakes, and Health: Current Status and Trends." The chapter provides a broad examination of food and nutrient intakes by the U.S population, the food and eating environment, and the prevalence of chronic health conditions. It provides an understanding of the relationship of food intake and the food environment to nutrition-related health conditions. It documents high rates of diet-related health conditions and provides compelling reasons to study them in greater detail. The chapter provides context for actions to facilitate and implement behavior change and adoption of healthy eating practices by the U.S. population. Taken together, these analyses inform the remaining chapters in the report, which will provide the contextual and scientific foundation for the 2015 *Dietary Guidelines for Americans*.

Dr. Neuhouser identified the topics addressed by SC 1: 1) Nutrient intakes and nutrients of concern for under- or over-consumption; 2) Food groups—current intakes and trends; 3) Food categories (which are different from food groups; they are foods as consumed, such as a sandwich or a mixed dish like lasagna)—current intakes and sources of energy, nutrients, and food group intakes; 4) Eating behaviors—current intakes and trends; 5) Prevalence and trends in health conditions; and 6) Dietary patterns composition.

Dr. Neuhouser described the methods used by SC 1, which included both data analysis and food pattern modeling. Data analysis was used for 21 questions. Most of the data used was from the National Health and Nutrition Examination Survey (NHANES), including What We Eat in America (WWEIA), the dietary component of NHANES. Additional data sources included the Surveillance Epidemiology and End Results cancer surveillance system (SEER) from the National Cancer Institute; the SEARCH for Diabetes in Youth Study; CDC population-based birth defects surveillance system; National Health Interview Survey; data from the Alzheimer's Association; and other CDC publications. For the food pattern modeling analyses, there were seven questions. In addition to the modeling conducted for this Committee, for several questions the SC brought forward summaries from modeling analyses by previous DGACs. Dr. Neuhouser noted that the SC has made no substantive changes since the work was previously reported in a public meeting. Therefore, what will be presented today will be a high level overview of the work the SC has accomplished, presenting some of the major themes.

Nutrient Intakes and Nutrients of Concern

Dr. Neuhouser began with the first topic area, Nutrient Intakes and Nutrients of Concern. Based on intake data from WWEIA, together with nutritional biomarker and health outcomes data, the SC identified nutrients that may pose a public health concern. Vitamin D, calcium, potassium, and fiber are underconsumed across the entire U.S. population and may pose a public health concern. Iron is underconsumed for adolescent and premenopausal females and may pose a public health concern. Sodium is overconsumed across the entire U.S. population and may pose a public health concern. Saturated fat is overconsumed and may pose the greatest risk to those over 50 years old. Previous DGACs have identified cholesterol as a nutrient of concern for overconsumption. The SC is not bringing forward that recommendation, and so cholesterol is not considered a nutrient of concern for overconsumption.

Dr. Neuhouser then showed sample figures that had been presented in previous meetings. First, a graph identified the percent of the population ages 2 and older with usual intakes of each nutrient below the estimated average requirement (EAR). The graph showed that for vitamin D, vitamin E, magnesium, calcium, vitamin A, and vitamin C, a substantial portion of the population has intakes below the EAR. Then Dr. Neuhouser showed a graph of sodium intakes, depicting the percent of age/sex groups with usual intakes above the tolerable upper level of intake (UL).

Sodium is overconsumed across the population. More about sodium will be presented later in this presentation and in the cross-cutting chapter.

Dr. Neuhouser noted that the SC also examined dietary supplements and caffeine, as part of the nutrients of concern topic. The SC found that overconsumption of nutrients from foods and beverages alone, including fortified foods, is rare. The SC was able to examine intakes from foods and supplements for a select set of nutrients. Folate, calcium, iron, and vitamin D may be overconsumed in some supplement users, especially those taking high-dose supplements. In general, caffeine intakes do not exceed what are currently considered safe levels for any age group.

Dr. Neuhouser next described the findings on the adequacy of the USDA Food Patterns. USDA Food Patterns are a system that provides food-based guidance. The Patterns meet nutrient adequacy goals across a broad range of age and energy levels. In addition, when adjusted for the food choices of young children, the Patterns meet their nutrient needs. The analysis specific to young children was new to this Committee. The USDA Food Patterns do not meet recommendations for potassium (Adequate Intake or AI) and vitamin D (Recommended Dietary Allowance or RDA). Additional fortification or supplementation strategies may be needed to reach RDA levels for vitamin D intake. Recommended amounts of food groups and their component subgroups fall within the broad range of usual food group intakes for the U.S. population.

Food Groups—Current Intakes and Trends

Dr. Neuhouser next addressed Food Groups—Current Intakes and Trends. Food groups include fruits, vegetables, grains, dairy, and protein foods, and are based on the USDA Food Pattern classification. Limits for solid fats and added sugars, which together are termed “empty calories,” are also part of the patterns, and limits are imposed in the Patterns. Across all age and sex groups, the vast majority of the U.S. population does not meet recommended intakes for the fruit, vegetable, whole grain, and dairy food groups. Across all age and sex groups, the vast majority of the U.S. population exceeds recommended intakes of refined grains, solid fats, and added sugars. Many young children consume recommended amounts of fruits and dairy foods, but these intakes drop as children reach school age and beyond.

Dr. Neuhouser showed, as an example, one of the figures of food group intakes, which had been presented at the July meeting. The graph showed the usual intakes of fruits as an estimated percentage of persons below, at, or above their recommendation. Many young children are getting recommended amounts of fruit, and the SC did a sub-analysis showing that they are eating whole fruit; this is not all fruit juice. The intakes drop off in mid-childhood and adolescence. These trends continue through early adulthood, and fruit intakes do not increase

again until later adulthood. Close to 80 percent of all Americans over the age of 1 year are not consuming recommended amounts of fruit. Dr. Neuhouser then showed a similar graph which compared intake of empty calories, that is, the calories from solid fats and added sugars, to their limits. This graph showed that all Americans, even young children, are consuming far too many empty calories.

Dr. Neuhouser noted that the SC examined trends over time in food group consumption. The U.S. population has made few dietary changes over the time period from 2001-04 compared to 2007-10. Dr. Neuhouser noted that fruit intake was low but stable over this time period; vegetable intake declined; whole grain intake increased but was still low, and refined grain intake decreased, but was still high; dairy intake was low but stable for most population groups; and added sugars intake decreased but still exceeded the limit in the USDA food patterns.

Food Categories—Sources of Energy, Nutrients, and Food Group Intakes

Dr. Neuhouser moved to the next topic area, Food Categories as Sources of Energy, Nutrients, and Food Group Intakes. Food categories identify foods as consumed. Nine major categories and 32 subcategories were analyzed. Mixed dishes (e.g., sandwiches, burgers, pizza, pasta/rice/meat/poultry mixed dishes, stir-fries, and soups) were the major contributor to intakes of three food groups—grains, vegetables, and protein foods. They also contributed heavily to intake of energy, saturated fat, and sodium. Dr. Neuhouser noted that fruit and fluid milk were seldom consumed as part of mixed dishes. Beverages contributed 19 percent of total energy intake, and the major sources of these calories were sugar-sweetened beverages, plus some from milk and milk drinks and 100 percent fruit juices.

Dr. Neuhouser presented a graph summarizing the percent of the total intake of the various food groups, selected subcategories, and nutrients of concern from mixed dishes, in comparison to the percent of total energy provided by mixed dishes. While mixed dishes contributed heavily to grain consumption, this graph shows that this contribution was dominated by refined grains. Similarly, mixed dish contributions to dairy intake were dominated by cheese rather than fluid milk.

Dr. Neuhouser noted that SC 1 was very interested in food sources of energy and presented a pie chart that summarized the percent of total energy intake that came from each of the nine major food categories. The chart shows that mixed dishes provided 29 percent of total energy, while 16 percent came from snacks and sweets, and smaller amounts from other categories. When mixed dishes were split out into the constituent subcategories, the percent of total energy intake from each was pizza, 4 percent; burgers and sandwiches, 14 percent; meat, poultry, and seafood mixed dishes, 4 percent; rice, pasta, and grain mixed dishes, 5 percent; and soups, 1 percent. Beverages, without milk and fruit juice, contributed 12 percent of energy.

Dr. Neuhouser continued with the SC's examination of the sources of sodium, saturated fat, and added sugars from the food categories. The SC found that mixed dishes were the largest contributor to intake of sodium and saturated fat. Within mixed dishes, the subcategory of burgers and sandwiches was the largest contributor for both. Sodium is ubiquitous in the food supply and many food categories contributed to intake. Snacks and sweets were a major contributor to both added sugars and saturated fat intake. Beverages supplied almost half of added sugars intake. Dr. Neuhouser showed a pie chart documenting the food sources of added sugars. Beverages, not including milk or 100 percent fruit juice, contributed 47 percent of added sugars intake, and snacks and sweets contributed 31 percent, so those were the two major sources. Within the beverage category, the biggest contributor to added sugars was from sugar-sweetened beverages, with 25 percent of all added sugars from soft drinks. She noted that more information on added sugars will be presented later in the meeting.

Eating Behaviors

Dr. Neuhouser then introduced the next topic, which is Eating Behaviors. The SC was interested in meals and snack patterns, how much people consume, where people purchase and consume foods, and so forth. She noted that the majority of the U.S. population consumed three meals a day plus at least one snack. Children ages 2-5 years were the most likely to consume three meals a day. Adolescent females, young adult males, non-Hispanic Blacks, Hispanics, and individuals with lower incomes were the least likely to consume three meals a day.

Dr. Neuhouser continued with the diet quality of meals. Breakfast tended to have a higher overall dietary quality compared to other meals and snacks. Adolescents and young adults were the least likely to eat breakfast. Snacks contributed about one-fourth of daily energy intake and were lower in nutrients of concern relative to energy intake than were meals. Dr. Neuhouser presented a graph of the percent of intake of the nutrients of concern from each eating occasion, in comparison to the energy intake from that eating occasion. A meal higher in the percent of nutrient than of energy was considered a good source of that nutrient relative to energy. For example, snacks contribute quite a bit of added sugars.

Dr. Neuhouser then presented data based on the location of food purchase. About two-thirds of the calories consumed by the U.S. population were purchased at a store, such as a grocery store or supermarket, and consumed in the home. The percent of calories eaten away from home has remained about the same since 2003-2004. Food group content and nutrient quality varied by where the food was obtained. However, no matter where the food was obtained, diet quality of the U.S. population was low in fruit, vegetables, dairy, and whole grains, and high in sodium, saturated fats, refined grains, solid fats, and added sugars.

Dr. Neuhouser illustrated this point by showing a sample graph of fruit group density, in cups of fruit per 1000 calories, by where the food was obtained and consumed. A horizontal bar identified the Healthy Eating Index (HEI) standard for that food group, which can be used as a metric to assess diet and how diet adheres to the *Guidelines*. For fruit, all sources provided less than the HEI standard per 1000 calories. An encouraging note was the amount of fruit from schools per 1000 calories, which was somewhat higher and closer to the HEI standard compared to other sources, while from restaurants and quick-serve restaurants, fruit amounts per 1000 calories were very low.

Health Conditions—Prevalence and Trends

Dr. Neuhouser moved on to the topic of overweight and obesity, summarizing data that have been presented previously. Current rates of overweight and obesity are extremely high among children, adolescents, and adults. These high rates have persisted for more than 25 years. About 65 percent of adult females and 70 percent of adult males are overweight or obese. Rates of overweight and obesity are highest in adults 40 years of age and older and vary by race and ethnicity.

Abdominal obesity is present in U.S. adults of all ages, increases with age, and varies by sex, race, and ethnicity. Nearly one in three youth, ages 2 to 19 years, is now overweight or obese and these rates vary by age and ethnicity. Dr. Neuhouser showed a graph of trends in rates of overweight and obesity for males and females over 20 years of age, which highlights these very high rates. Dr. Neuhouser summarized that these rates are far too high and have been far too high for far too long.

Dr. Neuhouser then noted that obesity is associated with cardio-metabolic risk factors in adults. The SC found that there was at least one cardio-metabolic risk factor in 56 percent of adults who were normal weight, 70 percent of adults who were overweight, and 75% of those who were obese. Rates of elevated blood pressure, dyslipidemia, and diabetes were highest in adults with abdominal obesity. In addition, 90 percent of children with type 2 diabetes were overweight or obese, and 93 percent of children with type 2 diabetes were 12 to 19 years old. Dr. Neuhouser reminded members that type 2 diabetes in children was not seen 30 or 40 years ago, except in rare cases. A graph showed the prevalence of CVD risk factors by weight category among adults 18 and older. A greater proportion of the population who were overweight, obese, or morbidly obese had more than one CVD risk factor. Among the obese and morbidly obese, there was a substantial fraction with three or more risk factors. However, even among normal weight people, a majority had one or more risk factors. These risk factors include diabetes, hypertension, dyslipidemia, and self-reported smoking.

Dr. Neuhouser next identified the SC's findings on other health conditions. At all ages, rates of chronic disease were linked to overweight and obesity. Adults had high rates of high blood pressure, CVD, diabetes, and various forms of cancer. Children and adolescents also had nutrition-related chronic diseases, including borderline high blood pressure and type 2 diabetes. Prevalence of osteoporosis and low bone mass increased with age, particularly in post-menopausal women. Nutrition-related neurological and psychological conditions are also a growing concern. Congenital anomalies were a relatively rare but important and concerning pregnancy outcome.

Dietary Patterns Composition

Dr. Neuhouser moved to the final topic, Dietary Patterns Composition, which weaves nicely into the SC 2 work which will be presented next. Dietary patterns that were observed to have health benefits in intervention and cohort studies had certain common elements. A healthful diet can be achieved by following a variety of dietary patterns. In many cases, the ranges of intake in dietary patterns with positive health benefits are close to those recommended by the USDA Food Patterns. The data from the intervention trials and the cohort studies examined by SC 2 provide empirical data that the USDA Food Patterns provide an evidence-based guide to healthy patterns of food consumption. Dr. Neuhouser then reviewed data presented at the last public meeting, using the fruit group intake slide as an example. The graph shows amounts, in grams and cups per 1000 calories, reported in the studies that seemed to provide health benefits, organized by the type of trial, scoring systems, or other data-driven approaches. These amounts are compared to a blue bar that shows the range recommended in the USDA Food Patterns and a pink bar that shows the range of usual adult consumption, also per 1000 calories. The amounts of fruit from many of these studies, especially those measured with a Mediterranean diet score, are close to what is recommended, providing optimism that the data and recommendations are pulling together in a unified theme.

Dr. Neuhouser then presented the data for the next question on dietary patterns, which was how intakes compared to recommendations. A graph showed average HEI scores and HEI component scores by age group. For many of the components, including the fruit component, the scores form a U-shape, with children having a higher score; pre-adolescents, adolescents, and young adults having lower scores; and older adults somewhat higher scores again. Total HEI scores also show a U-shape by age group; the overall total score in the U.S. population is 57 points out of a total of 100 points. Dr. Neuhouser summarized the overall findings for this question, noting that the best component scores were for total protein foods, seafood and plant proteins, and dairy. The poorest component scores were for whole grains, sodium, fatty acid ratio, greens and beans, and empty calories. The best HEI scores were for young children ages 2 to 3 years, middle-aged adults, and older adults; the poorest HEI scores were for preadolescents and adolescents.

Dr. Neuhouser then described the findings for the food pattern modeling the SC completed in relation to the USDA Food Patterns. These analyses have been presented previously. The analyses demonstrated that healthy eating patterns can be achieved with a variety of patterns: the Healthy U.S.-style Pattern, the Healthy Mediterranean-style Pattern, or the Healthy Vegetarian Pattern. Although some differences exist across the three eating patterns, comparable amounts of nutrients can be obtained by consuming nutrient-dense foods while maintaining energy balance. Therefore, a variety of eating patterns can be recommended to the U.S. population, and this could help the population follow a healthy eating pattern when there is some variety presented.

Summary and Research Recommendations

Dr. Neuhouser then summarized the major findings from SC 1. The U.S. population has low intakes of certain key nutrients – vitamin D, potassium, fiber, calcium, and for females, also iron. These low intakes are a public health concern because inadequate intakes are linked to health problems. The U.S. population overconsumes sodium and saturated fat. Excess intakes of these nutrients are also linked to health problems. Many of the food groups that are good sources of underconsumed nutrients are consumed in low amounts by the U.S. population. Many of the food groups and food categories that have high levels of sodium, saturated fat, and added sugars are consumed in high amounts. The U.S. population purchases and consumes food in a variety of locations. The diet quality is low regardless of where food is purchased or consumed. Rates of diet-related chronic conditions are high. Obesity, CVD, CVD risk factors, diabetes, cancer, and osteoporosis are all very common. Improving diet quality will help reduce risk of these diseases with major morbidity, mortality, and health care expenditures.

Dr. Neuhouser then reviewed the SC's research recommendations. While the U.S. is lucky to have the NHANES/WWEIA Nutrition Surveillance system, it needs more respondents from a variety of racial/ethnic minority groups, more non-U.S. born residents, and an increase in the number of pregnant women and older Americans included. All of these groups are currently under-represented in NHANES. Research is needed to understand the driving forces behind the decline in diet quality that begins in mid-childhood, through adolescence, and through adulthood. Improvements are needed in the quantity and quality of food composition databases to analyze what Americans are eating. Also, researchers need to 1) Investigate the validity, reliability, and reproducibility of new biomarkers of dietary intake and nutritional status; 2) Evaluate the effects of fortification and supplement use on consumer behavior related to intakes of nutrients of public health concern; 3) Understand the health effects from high-dose dietary supplements; 4) Develop standardized research definitions for meals and snacks; 5) Understand better the food landscape – where foods are purchased and consumed and how the food environment affects nutritional status; and 6) Understand better the concept of dietary patterns and develop standardized methods for dietary patterns research.

Dr. Neuhouser noted the tremendous support the SC had from Federal staff and noted their names: staff leads Trish Britten, Essie Yamini, Yat Ping Wong, and Shanthy Bowman; data analyses by WenYen Juan, Cynthia Ogden, Nadine Braunstein, Alanna Moshfegh, Brian Kit, Kirsten Herrick, and Hazel Hiza. Additional assistance was provided by Eve Essery Stoodly, Kristin Koegel, Kevin Kuczynski, Sue Krebs-Smith, Jill Reedy, and the science writer Anne Rodgers.

Discussion

Dr. Neuhouser then opened the floor to comments from other SC 1 members and then the DGAC as a whole.

Dr. Anderson noted that this had been a great “tour” of all the work that the SC had done and a very nice review of that work. Dr. Lichtenstein agreed that this was a very comprehensive and accurate summary of SC 1’s work. It also included the complexities of what the SC had to deal with. Dr. Pérez-Escamilla added that SC 1 was also very responsive to all of the feedback it received.

Dr. Nelson agreed and noted that she had two questions. The first question was whether the SC is recommending that in the policy document there be a recommended level or not for cholesterol. Dr. Neuhouser replied that USDA and HHS will formulate the policy, but the DGAC is not bringing forward statements from previous DGACs and therefore are not stating that cholesterol is a nutrient of concern. Dr. Lichtenstein added that recommended limits for dietary intake of cholesterol have been 200-300 milligrams, and current intakes are now 250-260 milligrams per day. Dr. Nelson asked if the Committee was not going to be specific but vague with cholesterol recommendations. Dr. Neuhouser stated that the SC does not have a recommendation and is not bringing previous recommendations forward. Dr. Nelson then asked a second question about the terminology being used for empty calories; it seems okay for added sugars but asked if solid fats do not bring any nutrients. Dr. Lichtenstein agreed that solid fats should be handled separately, because solid fats come as part of foods such as cheese and meat.

Dr. Campbell asked a question related to mixed dishes because they are such a broad category. Does this category include homemade mixed dishes as well as commercial dishes? Dr. Anderson replied that this question brings out some of the key issues around this food category that are discussed in the text. The SC has parsed out what constitutes mixed dishes in the pie charts that have been presented. Some additional details about the category, such as preparation technique, are available in the tables and appendices.

Dr. Campbell asked a second question related to the patterns being recommended as healthy patterns. He noted that the details of this for many food groups are contained in the tables. There

appears to be a potential inconsistency with red and processed meat. Many research studies, especially the Mediterranean diet studies, have higher than recommended intakes of red and processed meats. Dr. Neuhouser noted that this is an excellent question; the intakes in these studies are higher than what is recommended in the USDA Food Patterns. There is some further need to tease out and understand this. Dr. Lichtenstein added that there is no one Mediterranean diet, and SC 1 has prefaced the recommended pattern name with “healthy.” When SC 2 presented its conclusions, it became apparent that there are a number of common elements that describe a healthy dietary pattern. When the committee gets away from the specifics and goes more to looking at the common elements, it is easier to address this concern. Dr. Anderson noted that the SC grappled with this and when it seemed that one component of the pattern differed from what was expected, it was useful to go back to the bigger picture of the overall pattern to help interpret this. Even if one chooses a somewhat higher intake of red meat, if it is in the context of a healthy pattern overall, the data suggest some benefit and some flexibility.

Dr. Campbell followed up on this with a question as to whether these recommendations are quantitative or qualitative. For saturated fat, for example, the recommendation is to be less than 10 percent, about a 10 percent reduction from current intakes. With added sugars, the conclusion statement is to be less than 10 percent of calories. But that level of specificity is not captured in other statements. Dr. Millen replied that quantitative recommendations are noted in the food pattern modeling exercises, where specific amounts are set for each of the calorie levels. The patterns do meet the cut points the Committee has specified for saturated fat, added sugars, and so forth. There is no healthy pattern modeled where there is a high level of red and processed meat proposed, in order to achieve the saturated fat cut point. Dr. Campbell agreed and noted that the clarity of how criteria are defined is important, especially when moving into implementation of the *Guidelines* and applications such as the SuperTracker. The cut points are the measures by which people will judge their own success or lack thereof. If there is not a degree of specificity, it makes it much more challenging. Dr. Millen added that the beauty of the food pattern modeling is that it is a food-based approach, and the levels are set in the background to meet the *Guidelines*. So, the consumer can have this guide for daily food intake and understand that the expert cut points for nutrients are met. For some nutrients, they might not quite hit the target, for vitamin D, for example. The food-based guidance is a real contribution. Dr. Lichtenstein added that saturated fat comes from a number of food categories, not just red and processed meat. Over the years there has been a shift from nutrient-based recommendations to food-based dietary patterns. It is difficult to accurately calculate the exact percent of saturated fat or milligrams of certain nutrients, but by looking overall at the amounts of food groups, *Dietary Guidelines* can be created that are particularly actionable.

Dr. Hu expressed concern that saturated fat and solid fats were included in the same sentence in the report and wondered if this were needed, since it has caused confusion. Dr. Neuhouser replied that this has been a point of quite a bit of discussion in trying to develop terminology that

consumers can understand. The last DGAC used the term SoFAS (solid fats and added sugars), and before that the term used was “discretionary calories.” Both of those terms proved not to be useful. CNPP does use the term “empty calories” in some materials and found that to be understood by the public. That is one reason the SC has used that terminology, but there is not a perfect way to get at the concepts. Dr. Lichtenstein added that she also made a note about these terms and personally thinks that saturated fat is a better term. Dr. Neuhouser called on Dr. Trish Britten from CNPP to comment. Dr. Britten noted that the difference between saturated fat and solid fat is that saturated fat is a nutrient, though not an essential nutrient. All fats are composed of a mix of fatty acids; no fat is totally saturated fat or totally free of saturated fat. Solid fat is a food term, not a nutrient term. It is something a consumer can see, in contrast to saturated fat. A vegetable oil being put into a pan is different from butter or another solid fat being put into a pan, and this difference can be seen. Solid fats are a major source of saturated fat, but not the only one. Even the most unsaturated vegetable oils still contain some saturated fat. By just using the term saturated fat we would be going back, as Dr. Lichtenstein noted, to nutrient-based recommendations rather than food-based recommendations. Dr. Hu stated that it could be confusing, since some margarines have a high amount of unsaturated fats. Dr. Britten agreed that many solid fats, such as lard, for example, also contain a substantial amount of unsaturated fat. No fat is totally unsaturated, and no fat is totally saturated, either; they are all a blend. Dr. Lichtenstein added that partially-hydrogenated fat, even though consumption is decreasing, would also be considered in that category.

Dr. Hu then asked if cheese is considered a solid fat, a major source of saturated fat. Dr. Britten replied that all dairy fat, including the fat in cheese, cream, and whole milk, is considered a solid fat. Even though milk is a fluid, if the fat is extracted from it, that fat is a solid. Dr. Hu noted that there seems to be some inconsistency in recommendations for increased dairy intake when cheese is a major source of saturated fat and sodium. He noted that not all dairy products are created equal, but there is an inconsistency from the nutrients to the foods. Dr. Neuhouser replied that what is recommended is that consumers shift from cheese to more fluid milk. Food pattern modeling presented in July demonstrated that this shift decreases sodium. If intake shifts to less cheese and more fluid milk, this change in proportions would decrease sodium and increase nutrients of concern, including vitamin D. Dr. Hu noted that if changing from cheese to lowfat milk, the dairy fat is still in the food supply, so it might not change saturated fat intake of the population. Dr. Lichtenstein returned to Dr. Hu’s earlier point and stated that we should probably not use solid fat and saturated fat in the same list.

Dr. Hu then asked about vegetable group intake and the inclusion of potatoes. Dr. Neuhouser noted that the vegetable group includes subgroups, one of which is starchy vegetables, which includes but is not all potatoes. Potatoes are included in the definition of the vegetable group. Dr. Hu noted that without potatoes, vegetable consumption would go down markedly. Dr. Lichtenstein asked if the trend over time would actually change if white potatoes were excluded.

Dr. Britten noted that trends in overall vegetable intake were examined, and they went down significantly but a small amount. Trends in the vegetable subgroup intakes were not examined. The composition of total vegetable intake was examined, and the starchy vegetable, red-orange vegetable, and other vegetable subgroups are consumed in about equal amounts, with the dark green vegetables and the beans and peas subgroups consumed in much smaller amounts. If potatoes were removed from calculations of vegetable intakes, total vegetable consumption would be about 25 percent less than it is now, and vegetable consumption is quite low. Dr. Hu noted that in most of the studies examined by SC 2, potatoes were not counted as a vegetable, and they are higher in carbohydrate than other vegetables. Most other vegetables contain small amounts of carbohydrate. Dr. Britten noted that potatoes do contain potassium and fiber, two nutrients of concern. Dr. Neuhouser added that the nutrients from potatoes also depend on how they are prepared. Dr. Hu reiterated that most of the U.S. studies did not include potatoes as a vegetable.

Dr. Millen noted that the SC has presented compelling evidence on problems in food and nutrient intake and related health problems in the country – where we are and where we need to be. Dr. Millen asked what information related to the current intakes and trends might give an idea that healthy dietary intakes can be achieved. Dr. Neuhouser suggested that this might best be discussed after hearing the evidence from SC 3 and SC 4 about what types of approaches work. Whole grains intakes have increased, though they are still low, and refined grains and added sugars intakes have decreased, though they are still high. Also, young children consume some food groups in amounts recommended but then consumption drops in older childhood, and these patterns are carried through to adulthood. To harness and understand the motivations for the good intakes among young children will take understanding the totality of the food environment. Dr. Lichtenstein concurred and added that we need to think about what is available. For example, if one is eating out, very little whole grain is available; most is refined grain. Fruits and vegetables are often not an integral part of a meal when eating in a sit-down restaurant. So, a lot has to do with the food environment and the default option in these places. When eating at home and shopping in a supermarket, a person has a much broader range of choices and more control. Dr. Neuhouser added that SC 3 will address the other important issues of food security, food availability, and food familiarity among those who are less acculturated. Dr. Millen noted that it is encouraging that the options for healthy dietary patterns are clear, and these patterns overlap at least to some extent with the current American diet. Therefore, the patterns to be recommended are not so foreign as to be impossible to achieve. Also, in terms of the quality indexes, the HEI average score is 57 out of 100, not zero, which suggests that American diets are part of the way there. There is a foundation of intake of vegetables, low fat dairy, and fruit, for example, though lower than recommended, is part of the way there. Those are positive and encouraging messages to deliver in the face of compelling evidence to take action.

There were no further questions, so Dr. Neuhouser concluded SC 1's presentation.

Subcommittee 2 (SC 2): Dietary Patterns, Foods and Nutrients, and Health Outcomes

Dr. Alice H. Lichtenstein, DGAC Vice-Chair, delivered the SC 2 presentation in place of the SC 2 Chair, Dr. Anna Maria Siega-Riz, who was unable to attend the meeting in person but participated in the meeting and discussion by telephone. Dr. Lichtenstein acknowledged the contributions of the other members of SC 2: Dr. Cheryl Anderson, Dr. Tom Brenna, Dr. Steven Clinton, Dr. Frank Hu, Dr. Marian Neuhouser, and Dr. Rafael Pérez-Escamilla. Dr. Lichtenstein briefly reviewed the scope of SC 2, which is to examine the relationship between dietary patterns, foods, and nutrients, *and* preventable diet-related diseases, obesity, and mortality. No substantive changes were made to the SC's conclusions or recommendations since the last public meeting.

The SC 2 efforts to examine dietary patterns were described. Dr. Lichtenstein reviewed the definition of dietary patterns as the “quantities, proportions, variety or combinations of different foods and beverages in diets, and the frequency with which they are habitually consumed.” She then reviewed the approaches for examining dietary patterns, as outlined by Dr. Sue Krebs-Smith at the second DGAC public meeting. These methodologies include indices and scores, cluster analysis, factor analysis, and selective diets.

When reviewing the evidence, the Committee attempted to adhere to the language used by the study authors in describing food groupings. There was some variability across studies in defining food groupings. Vegetables, for example, differed with respect to the inclusion or exclusion of white potatoes; some studies also distinguished vegetable preparation methods (e.g., fried versus baked potatoes). The Committee's conclusions are expressed in relative terms—higher versus lower intakes, as this reflects the nature of the available data.

The Committee used existing reports and original NEL systematic reviews to examine the association between dietary patterns and health. Specific health outcomes of interest included cardiovascular disease (CVD), body weight, type 2 diabetes, cancer, congenital anomalies, neurological and psychological illnesses, and bone health. The strongest evidence was found for cardiovascular disease and weight loss among overweight and obese adults.

Numerous dietary patterns were identified in the literature; however, there was remarkable consistency in the findings. Common characteristics of dietary patterns associated with positive health outcomes include: higher intake of vegetables, fruits, whole grains, low-fat dairy, fish/seafood, legumes, lean meat, and nuts; moderate intake of alcohol; lower consumption of red and processed meat; and low intake of sugar-sweetened foods and beverages and refined grains. Based on its review of the evidence, the Committee recommended a diet rich in vegetables, fruits, whole grains, fish/seafood, legumes, and nuts; moderate in dairy products (e.g., low and

non-fat dairy) and alcohol; lower in red and processed meat; and low in sugar-sweetened foods and beverages and refined grains.

Dr. Lichtenstein noted that the recommended dietary patterns can be achieved in many ways and can be tailored to individual and cultural preferences and health needs. The Committee's recommendations reaffirm the dietary pattern characteristics recommended by the 2010 Advisory Committee. Further, the dietary pattern characteristics discussed in the SC 2 chapter of the report complement the quantitative descriptions of the dietary patterns in Part D, Chapter 1 of the Committee's final report, as described earlier by Dr. Neuhouser. Although the Committee found little evidence that examined dietary patterns in children, the healthy dietary patterns discussed in the report do apply to children, and they are reaffirmed with the USDA Food Patterns analyses, which consider nutrient needs across the lifespan.

The Committee concluded that moderate alcohol intake can be a component of a healthy dietary pattern, provided it is consumed in moderation and only by adults. The Committee also carried forward several conclusions of the 2010 Advisory Committee that relate to alcohol. Dr. Lichtenstein added that the Committee is not recommending that anyone begin drinking or increase the frequency of their alcohol use on the basis of potential health benefits. There are circumstances when people should not use alcohol. Additionally, women who are breastfeeding should be very cautious about drinking alcohol, if they choose to drink at all.

Dr. Lichtenstein stated that a multi-level process is needed to help Americans achieve a healthy dietary pattern and other lifestyle behaviors to reduce chronic disease and improve overall well-being. The Committee recommends the development and implementation of policies, programs, and services, including preventive services, to achieve healthy dietary patterns in a variety of settings.

In outlining the Committee's research recommendations, Dr. Lichtenstein noted that dietary pattern research for other health outcomes is needed to strengthen the evidence beyond cardiovascular disease and body weight in diverse populations across the life course. The ability to understand and precisely characterize the food constituents of healthy dietary patterns and the implications of these food constituents on nutrient adequacy through food pattern modeling is needed. Finally, research is needed to examine the long-term cardio-metabolic effects of the dietary patterns identified in the American Heart Association/American College of Cardiology (AHA/ACC)/The Obesity Society *Guidelines for the Management of Overweight and Obesity in Adults* that are capable of resulting in short-term weight loss.

Discussion

Dr. Neuhouser commented that the research recommendations mirror the SC 1 recommendation to improve methods to study dietary patterns, as most of the instruments used in earlier research were not designed to assess dietary patterns. A high priority recommendation is methods research to assess long- and short-term dietary exposures. Many diet-related chronic diseases relate to life course exposures and yet, many cohort studies only cover the period from mid-life to death.

Dr. Adams-Campbell asked for clarification on the “take away” message for the public, related to alcohol use. Dr. Lichtenstein responded that moderate alcohol intake is associated with health benefits. The Committee was clear not to recommend that people initiate alcohol use or increase their use to achieve health benefits. Dr. Pérez-Escamilla added that there are potential health benefits as well as some risks. In other words, there is a “trade-off.” Dr. Lichtenstein reiterated that the wording in the report states “potential” health benefits, as there are other considerations related to cancer risk and alcohol dependency that need to be considered as well. Dr. Hu commented that what is new is that moderate alcohol use can be part of a healthy dietary pattern.

Dr. Nelson stated that red and processed meats are woven into several Committee chapters. The lower intake of red and processed meat is a theme of the three healthy dietary patterns described in Part D, Chapter 1. Dr. Lichtenstein clarified that the vegetarian dietary pattern excludes these foods entirely. Dr. Nelson requested confirmation that the quantities of red and processed meats in the healthy dietary patterns are lower than current U.S. population consumption levels, and this was confirmed. Dr. Neuhouser provided perspectives from the SC 1 review of dietary patterns reported in the literature. The red and processed meat components in the different studies varied tremendously in terms of the types and amounts of foods consumed. For example, some red and processed meats are included within the context of healthy Mediterranean dietary patterns that were shown to be beneficial, whereas the DASH Omni levels were lower.

Dr. Anderson commented that sodium is noticeably absent from the dietary pattern slides. She asked if sodium should be included in the overall recommendations. Dr. Lichtenstein mentioned the conundrum between foods and nutrients; for example, added sugars versus sugar-sweetened foods and beverages. Dr. Neuhouser stated that the Committee used what was in studies and scoring systems—if sodium is there, it is appropriate to consider, but one cannot add something that was not part of the studies. Dr. Hu noted that the only diet indices that incorporated sodium were the DASH diet studies. Sodium is not mentioned in most of the other dietary pattern analyses. Dr. Millen commented that sodium, saturated fat, and added sugars evidence in the Integration chapter will dovetail with the dietary pattern evidence and cuts across various subcommittees. The point will be made that the healthy dietary patterns have beneficial nutrient profiles. Dr. Anderson agreed to this approach as long as the sum total emerges in the Integration chapter.

Dr. Campbell questioned the recommendation to increase intake of lean meat but lower intake of red meat. Dr. Neuhouser stated that the USDA Food Pattern Modeling used lean cuts of meats, including red meat. Historically, red and processed meats were often lumped together in research studies, though this is study-dependent. Clarification would be useful to the public as the nutrient content of lean beef, for example, differs from fatty meat and processed meat.

Dr. Campbell felt a research recommendation and clear statements are needed with respect to red meat and non-red meats, including poultry, because they are sources of protein. Dr. Lichtenstein asked the Committee for suggestions to improve the clarity of the recommendations and conclusions. Dr. Siega-Riz and Dr. Hu added that some study food frequency questionnaire (FFQ) instruments had separate questions about intakes of red and processed meats. However, few studies distinguished lean cuts from higher fat cuts of meat. Dr. Neuhouser also acknowledged the variability of reporting across research. Dr. Hu felt it was important to be explicit about poultry and chicken. Dr. Millen commented that it is not internally inconsistent to have higher intake of one category and lower of another—higher intake of whole grains and lower intake of refined grains, for example. The “art form” is in providing a clear definition and communication strategy. Dr. Pérez-Escamilla stated that if the term “lean meat” is used, a clear operational definition should be included for clarity. Dr. Lichtenstein confirmed that the term “processed meat” is in the report glossary; the term “lean meat” is not.

Dr. Siega-Riz commented that lean meats were mentioned in some of the dietary pattern studies, but there were variations. Dr. Nelson noted that while some ambiguity exists, there is evidence for the three healthy dietary patterns and is reluctant to make changes, given the large amount of work that was done. Dr. Lichtenstein urged the Committee to reach consensus on the meat issue. Dr. Hu felt that given the current evidence base for dietary patterns, one cannot be too specific about the type of red meat—lean, etc., —because it was not assessed; however, chicken and poultry were often included in analyses. Dr. Siega-Riz mentioned that the NEL cardiovascular disease and AHA/ACC reports provided the strongest evidence and neither used the term “lean meats.” For cardiovascular disease, poultry was specifically mentioned. Dr. Campbell acknowledged that the final wording impacts the Executive Summary and Integration chapters. Dr. Pérez-Escamilla stated that the Committee must be consistent about the basis for its recommendations and the evidence that informed them.

Dr. Neuhouser mentioned that terms such as low, lower, high, and higher were discussed initially. It was decided that higher and lower should be used, because diet assessment instruments are used for relative comparisons across quintiles or quartiles of intake. SC 1 tried to tease out the quantitative estimates for the dietary pattern composition piece. This is the first time dietary patterns have been taken on, so considerable work lies ahead to assess and measure dietary pattern composition. Dr. Siega-Riz reiterated the whole diet approach and acknowledged that increasing one component means decreasing something else. Dr. Lichtenstein asked for

consensus to leave recommendations as written or to change them; the SC decided to meet over lunch to discuss further and to bring its discussion back to the full Committee after lunch.

Dr. Pérez-Escamilla commented on the fish and seafood terminology. Seafood, which encompasses fish and shellfish, was used in the 2010 *Dietary Guidelines*. It is important to be consistent regarding fish/other seafood versus fish/seafood. In looking back at the FFQ instruments used in various studies, Dr. Siega-Riz commented that some instruments had separate questions on fish, others included shellfish questions, and some combined fish and shellfish. Seafood is the appropriate encompassing term to use and is included in the glossary, and this will be updated in the final report.

The following SC 2 discussion occurred after the lunch break but is inserted here with the morning SC 2 presentation and discussion.

Dr. Lichtenstein presented a revised summary statement when the meeting resumed after lunch. In reviewing the evidence, SC 2 determined that with the exception of the evidence for cancer, lean meat did not appear in the evidence reviews. The modified summary statement is: “Common characteristics of dietary patterns associated with positive health outcomes include higher intake of vegetables, fruits, whole grains, low and non-fat dairy, fish/seafood, legumes, and nuts; moderate intake of alcohol; lower consumption of red and processed meat; and low intake of sugar-sweetened foods and drinks, and refined grains.” The Committee agreed to the revised text. Thus, the term “lean meat” will be removed from the summary statement and as well as from the Executive Summary. The Committee also modified the dairy descriptor to be consistent with other sections of the report, to read: “low and non-fat dairy.”

Dr. Campbell asked if the Committee discussed a research recommendation to clarify the dietary components in the dietary patterns. Dr. Neuhouser stated that although this was not discussed specifically, the SC 1 and SC 2 research recommendations address the need to better understand dietary pattern composition and food components. Dr. Campbell felt this was inadequate. Dr. Lichtenstein stated that the research recommendation statements can be modified to stress the protein-containing food components per Dr. Campbell’s concerns.

Subcommittee 3 (SC 3): Diet and Physical Activity Behavior Change

Dr. Rafael Pérez-Escamilla, SC 3 Chair, began by acknowledging the other members of SC 3: Dr. Wayne Campbell, Dr. Steven Clinton, Dr. Anna Maria Siega-Riz, Dr. Lucile Adams-Campbell, Dr. Barbara Millen, the Committee Chair, and Dr. Michael G. Perri, Consultant. Dr. Pérez-Escamilla discussed the scope of SC 3 which was previously shared in detail at the prior public meetings. This subcommittee focused on individual behavior change. Topics included behaviors and contextual factors influencing an individual’s ability to make behavior

changes. The key strategy was found to be self-monitoring. It was noted that sleep patterns and mobile health were emerging areas of interest. Dr. Pérez-Escamilla highlighted acculturation and household food insecurity as two important contextual factors that shape the ability of Americans to achieve recommended behaviors, focusing on: 1) family shared meals; 2) eating out; 3) food and menu labeling; 4) sedentary behaviors; and 5) self-monitoring. It was noted that these behaviors and interventions are assessed with: 1) diet and physical activity outcomes; 2) weight/anthropometry outcomes; and 3) chronic disease risk/biomarker outcomes.

Major Conclusions and Recommendations

Dr. Pérez-Escamilla addressed the methodology used for the subcommittee work and noted that most questions were addressed using the Nutrition Evidence Library (NEL) systematic review with the exception of two topics. The eating out question was an update to the 2010 DGAC's NEL systematic review. Also, one of the sedentary behavior questions was addressed using the Community Preventive Services Task Force Obesity Prevention and Control report: "Behavioral Interventions that Aim to Reduce Recreational Sedentary Screen Time Among Children." It was noted that there have been no substantive changes since SC 3's work was reported in the previous public meetings. Dr. Pérez-Escamilla then presented the major conclusions and recommendations of SC 3 work.

For the eating out topic area, the first conclusion statement stated, "Among adults, moderate evidence from prospective cohort studies in populations ages 40 years or younger at baseline indicates higher frequency of fast food consumption is associated with higher body weight, body mass index (BMI), and risk for obesity." The Committee grade was moderate. A second conclusion statement noted that, "Among children, limited evidence from prospective cohort studies in populations ages 8 to 16 years at baseline suggests that higher frequency of fast food consumption is associated with increased adiposity, BMI z-score, or risk of obesity during childhood, adolescence, and during the transition from adolescence into adulthood." The Committee grade was limited. Research recommendations include the development of a standard methodology to collect and characterize various types of eating venues and to conduct rigorously designed research to examine the longitudinal impact of obtaining or consuming meals away from home from various types of commonly frequented venues on changes in food and beverage intakes in diverse groups of men and women.

The family shared meals topic area conclusions were then presented. The conclusion statement noted, "Limited evidence from prospective studies shows inconsistent relationships between the number of family shared meals and body weight of children and adolescents." The Committee grade was limited. Research recommendations include conducting studies in diverse populations that assess frequency and quality of family shared meals and conducting randomized controlled trials to isolate the effect of interventions that increase the frequency of family meals.

The sedentary behavior topic area was then presented. One conclusion statement noted, “Moderate and consistent evidence from prospective studies that followed cohorts of youth into adulthood supports that adults have a higher body weight and incidence of overweight and obesity when the amount of TV viewing is higher in childhood and adolescence.” The Committee grade was moderate. A second conclusion statement noted that, “Moderate evidence from prospective studies suggests no association between sedentary behavior in adulthood and change in body weight, body composition, or incidence of overweight or obesity in adulthood.” The Committee grade for this second statement was moderate. The final conclusion statement for sedentary behavior stated, “The DGAC concurs with the Community Guide, which found strong evidence that behavioral interventions are effective in reducing recreational sedentary screen time among children ages 13 years and younger. Limited evidence was available to assess the effectiveness of these interventions among adults and no evidence was available for adolescents ages 14 years and older.” The final Committee grade was strong for children ages 13 years and younger. Research recommendations include the development of improved and better standardized and validated tools to assess sedentary behaviors in children, adolescents, and adults, as well as conducting prospective research to examine the effects and mechanisms of the quantity, patterns, and changes of sedentary behaviors on diet quality, energy balance, body weight, adiposity, and health across the lifespan within the diverse American population.

The self-monitoring topic area conclusions were then presented. One conclusion read, “Moderate evidence, primarily in overweight adult women living in the United States, indicates that self-monitoring of diet, weight, or both, in the context of a behavioral weight management intervention, incorporating goal setting and performance feedback, generally improves weight-loss outcomes.” The Committee grade was moderate. A second conclusion statement read, “Limited but consistent evidence suggests that higher frequency or greater adherence to self-monitoring of diet, weight, or both, in the context of a behavioral weight management program, is associated with better weight-loss outcomes.” The Committee grade was limited. Research recommendations include evaluating the impact of self-monitoring on body weight outcomes, evaluating the comparative effectiveness of performance feedback delivered through automated systems versus personal counselor interactions, testing the effectiveness of self-monitoring on weight outcomes in understudied groups, and conducting randomized controlled trials based on sound behavioral change theories that incorporate self-monitoring to test the effects of mobile technology on dietary and weight outcomes.

The food and menu labeling topic area was then presented. The conclusion statement read, “Limited and inconsistent evidence exists to support an association between menu calorie labels and food selection or consumption.” The Committee grade was limited. Research recommendations include developing novel label approaches to convey caloric intake values on foods consumed at home and in restaurant settings, comparing labeling strategies across various

settings to determine their efficacy in altering food selection and health outcomes, and evaluating process and impact of recent FDA food and menu labeling regulations.

The household food insecurity topic area was then presented. The conclusion statement read, “Limited and inconsistent evidence from studies conducted in adults and children ages 3 to 6 years suggests that a positive association may exist between persistent and/or progressing household food insecurity and higher body weight in older adults, pregnant women, and young children. No studies reported a relationship with lower body weight.” The Committee grade was limited. Research recommendations include conducting prospective cohort studies that cover a wide range during childhood and adolescence and describe potential effect modifiers while examining the relationship between household food insecurity, dietary intake, and body weight, as well as standardizing a research methodology by developing a consistent approach to measuring food insecurity and using measured height and weight to reduce the likelihood of responder bias.

The last topic area, acculturation, was then presented. One conclusion statement read, “Limited evidence from cross-sectional studies suggests that in adults of Latino/Hispanic national origin, particularly among women and persons of Mexican origin, higher acculturation to the United States is associated with lower fruit and vegetable intake, as well as higher intake of fast food. Insufficient evidence is available for children, Asians and African Americans in general, and among populations of diverse Latino/Hispanic national origin to draw a conclusion regarding the association between measures of acculturation and dietary intake.” The Committee grade was limited. A second conclusion statement read, “Limited evidence suggests a relationship between higher acculturation to the United States and increased body weight. This relationship varies by national origin and gender. Specifically, findings were mixed in both Asian and Latino/Hispanic populations. In Asians, the association was stronger in women than men; and in Latino/Hispanic populations, associations were stronger in Mexican-born women.” The Committee grade was limited. Research recommendations include conducting prospective longitudinal studies that start in early childhood to track dietary intake, sedentary behaviors, body weight, and chronic disease outcomes across the life course in the diverse American population, including comparison groups in countries of origin to rule out any confounding factors, as well as developing a standard tool to measure acculturation or validation of multidimensional acculturation scales in different immigrant groups and in different languages.

The chapter summary was then presented with Dr. Pérez-Escamilla stating that motivating and facilitating individual behavior change is necessary and mentioned several possible behavioral strategies including reducing screen time, reducing the frequency of eating out at fast-food restaurants, increasing frequency of family shared meals, self-monitoring of diet and physical activity behavior, and effective food labeling to target healthier food choices. Three action items were presented, including: 1) Continuous support of Federal programs to help alleviate the

consequences of household food insecurity; 2) Food and nutrition assistance programs take into account the risk that immigrants have of giving up their healthier dietary habits soon after arriving in the United States; and 3) Efforts to provide all individuals living in the United States with the environments, knowledge, and tools needed to implement effective individual- or family-level behavioral change strategies to improve the quality of their diets and reduce sedentary behaviors.

Discussion

Dr. Story asked if body weight could be added to one of the promising behavioral strategies mentioned in the chapter summary. The promising behavior originally read, “Self-monitoring of diet and physical activity behavior.” Dr. Pérez-Escamilla indicated that yes, it would be correct to include self-monitoring of body weight since that was an area looked at by SC 3.

Dr. Neuhouser commented on the research recommendations for household food insecurity. Dr. Neuhouser asked to include the term “elders” in the research recommendations as elders often live on their own, could have limited resources, and could be at risk of food insecurity. Dr. Pérez-Escamilla agreed to include older adults in the research recommendations. Dr. Siega-Riz noted that the two largest studies were done in the older population and clarified that the research recommendations did not include older adults since there was research in that population. Dr. Pérez-Escamilla noted the research did not include a variety of racial/ethnic groups and decided to include older adults in the research recommendations.

Dr. Hu questioned the sedentary behavior conclusion statement that read, “Moderate evidence from prospective studies suggests no association between sedentary behavior in adulthood and change in body weight, body composition, or incidence of overweight or obesity in adulthood.” He noted he was surprised with the finding. He stated the conclusion implies that increasing or decreasing sedentary behavior has no effect on body weight. Dr. Campbell responded that the conclusion statement is a reflection of the data that was assessed for this question. He noted there were cross-sectional relationships with sedentary behavior and body weight, but that it was difficult to determine which caused the other. Dr. Campbell reiterated that there was no evidence with sedentary behavior and *changes* in body weight during the intervention period.

Dr. Hu stated he was aware of several studies, and commented on this when reviewing the chapter, on the relationship between sedentary behavior and weight gain over 10 to 20 years. He stated it was not clear why these studies were not considered. Dr. Campbell noted that all of the evidence was evaluated based on the NEL criteria as originally set up for the question, and Dr. Pérez-Escamilla noted there were date ranges of the search that may have limited some evidence. Dr. Hu stated that a New England Journal of Medicine (NEJM) paper, one he had suggested they include, was published in 2012 and was in the date range of the NEL search. In that study, increased screen time was associated with increased body weight over a long follow-up. He

questioned why this was not picked up in the literature search. Additionally, he stated the “moderate” conclusion implies there is good evidence for the conclusion; Dr. Hu suggested changing the conclusion to a limited grading. Dr Pérez-Escamilla stated that overall, the conclusion in children was the most important. Dr Hu maintained that he did not understand where “moderate” came from and why the NEJM paper was not included in the evidence base.

Dr. Anderson noted that with acculturation, since there is a limited evidence base, she suggested that research recommendations could be broadened to include other populations, in addition to those starting in early childhood. Dr. Anderson also asked about the racial/ethnic approach and suggested using “racial/ethnic groups of diverse national origins” which would cover a broader range of immigrants. Dr. Campbell inquired where people are coming from around the world to the United States and whether there was a meaningful immigration population from Europe and other areas that may be an important population to study. Dr. Pérez-Escamilla noted that there are many areas of the U.S. with various immigrant groups and agreed with Dr. Anderson’s suggestion for editing the wording to be more inclusive.

Dr. Nelson noted a research recommendation related to sedentary behavior and body weight in the physical activity chapter. Dr. Nelson followed up on Dr. Hu’s statements and asked that SC 3 reconsider the moderate grade for weight outcomes and sedentary behavior in adults. Dr. Pérez-Escamilla noted that there was a considerable body of evidence for that question. Dr. Hu stated this is a difficult area to study and that it is difficult to define sedentary behavior, so it is hard to justify a moderate grade.

Dr. Lichtenstein asked how accurate the methodology was to track sedentary behavior in the studies evaluated. Dr. Lichtenstein asked if this could be considered inadequate evidence, related to how sedentary behavior was assessed. If one does not have confidence in the instrument, the data could be inadequate. Dr. Neuhouser stated there was also potential to under-report sedentary behavior. Dr Hu concurred and restated the evidence should be graded limited, also because there were no randomized control trials. Dr. Pérez-Escamilla stated that developing better assessments of sedentary behavior is a SC 3 research recommendation. He noted that the methods were different across the 22 studies from 17 prospective cohorts and shared that SC 3 detected relationships in adolescents, but not in the adult population. Dr. Hu noted that there were good data in children and also evidence with sedentary behavior and obesity outcomes in adults. Dr. Pérez-Escamilla said that he would follow up with SC 3 and staff during lunch.

The Committee then broke for lunch during which SC 2 and SC 3 met to discuss the above identified issues.

Dr. Pérez-Escamilla, after discussion with SC 3 over lunch, reiterated that SC 3 recommends keeping the moderate grade after reviewing the evidence evaluated for this question. Dr Hu

continued to ask why the NEJM study was not included in the literature search. Dr. Pérez-Escamilla requested that Joanne Spahn respond to Dr. Hu's question and recommendation for additional papers. Dr. Hu emphasized that the NEJM study was one of the largest studies on this topic, including 3 cohorts and >300,000 subjects. Ms. Spahn responded that the NEJM study was not "key worded" to pick up sedentary behavior but probably would otherwise have met inclusion criteria. She continued that all 17 included studies were in the "null" direction. Dr. Hu said the NEJM study would overwhelm the other studies, due to combined cohort sizes. He maintained that the evidence grade was too strong, given the diversity of sedentary behaviors in the 17 studies cited. Dr. Pérez-Escamilla stated SC 3 felt it was the strongest body of evidence they had across their SC questions. Dr. Hu stated that SC 3 should at least include the NEJM paper in the discussion of the chapter for context, as it provides important evidence for linking screen time with body weight outcomes in adults.

Subcommittee 4 (SC 4): Food and Physical Activity Environments

Dr. Mary Story, SC 4 Chair, stated that SC 4 evaluated the food environment and settings. The Subcommittee recognized that it is the individual's decision to determine what and how much to eat, but the environmental context and condition influence what food is available. Dr. Story then recognized the other SC 4 members, Dr. Lucile Adams-Campbell, Dr. Wayne Campbell, Dr. Miriam Nelson, and Dr. Barbara Millen, the Committee Chair.

Dr. Story stated that the 2010 *Dietary Guidelines for Americans* first recognized the role of the food environment in promoting or hindering healthy eating. Based on this, the DGAC decided to evaluate key settings within the food environment, including community food access, early care and education, school, and worksite settings. Within each of these settings the aim of the SC was to understand and assess the role of the food environment in promoting or hindering healthy eating, and to identify the most effective evidence-based diet-related programs, practices, environmental and policy approaches to improve public health and reduce disparities.

After reviewing the questions that were developed for each of the key settings and the approach that was used to answer each question, Dr. Story provided a summary of the SC's findings. The DGAC found: 1) Strong to moderate evidence that school and worksite policies are associated with improved dietary intake; 2) Moderate evidence that multi-component school-based and worksite approaches increase vegetable and fruit consumption; and 3) Moderate and promising evidence that multi-component obesity prevention approaches implemented in childcare settings, schools and worksites improve weight-related outcomes. For the community food access questions addressing the relationship between food retail settings and dietary intake and weight status, the evidence was too limited or insufficient to assign grades. Dr. Story relayed that to reduce the disparity gaps that currently exist in low resource and underserved communities, more

solutions-oriented initiatives and policies are needed on ways to increase access and procurement of healthy foods, and also to reduce access to nutrient-poor foods.

Dr. Story stated the implications of these findings: 1) Environmental and policy approaches are needed to complement individual-based efforts to improve diet quality and reduce obesity; 2) Environmental approaches have the potential for broad and sustained impact at the population level; and 3) Across the key settings, multi-component interventions were more effective than single component interventions. Dr. Story then provided examples of specific strategies that were identified in the early care and education, school, and worksite settings. For obesity prevention, effective multi-component interventions incorporated both nutrition and physical activity. For multi-component dietary interventions, effective strategies included nutrition education, parent engagement, and environmental policies, such as nutrition standards, food service changes, and point-of-purchase information. Dr. Story stated that this evidence can be used to inform and guide new multi-component individual and environmental policy approaches and that collaborative partnerships and strategic efforts will be necessary to translate the evidence into action, particularly in high-risk populations. Finally, Dr. Story ended by acknowledging the contributions of Federal staff who assisted the SC with its work.

Dr. Story facilitated a discussion with the DGAC about the overall findings from SC 4.

Discussion

Dr. Neuhouser asked a question of clarification between the use of multi-level versus multi-component interventions. Dr. Story stated that multi-component intervention is different from multi-level and clarified that multi-level interventions include environmental-based approaches and individual-level approaches, implemented at various points on the social-ecological model.

Dr. Millen asked a question about the use of the term “moderate and promising evidence” related to the weight-related outcomes in early care and education, schools, and worksite settings. Dr. Story noted that this was used because the findings were very encouraging that the interventions are showing some impact on weight outcomes and dietary intake.

Dr. Pérez-Escamilla asked if any of the school-based interventions involved children in growing, preparing, or cooking their own fruits and vegetables. Dr. Story responded that in the early care and education research there was evidence related to children in growing and preparing their own food and it having a beneficial impact on dietary intake. Dr. Campbell responded that the school-based interventions were multifaceted and included hands-on food preparation in classrooms and elsewhere throughout the school. One caveat to the school-based research is that the interventions were mostly conducted in elementary and middle schools. Dr. Lichtenstein suggested that more integration with nutrition education in high school curriculum

could be one means to better prepare students for later-life experiences (e.g., calculating calories in math class). Dr. Campbell responded that both policy approaches and interventions were needed to impact dietary intake.

Dr. Lichtenstein stated that one research recommendation for the SC could be more exploration into the role of the default option in influencing dietary intake. Dr. Story responded that because the SC did not look at eating locations such as restaurants, the issue of default options is in the research recommendations for Chapter 1. Dr. Campbell stated that this is also included in the research recommendations for Chapter 3 and added that changing the default option in schools, for example, changing the type of milk available, had demonstrable impact on dietary intake.

Dr. Millen asked how specific the worksite literature was in terms of multi-component interventions. Dr. Adams-Campbell responded that the worksite interventions included nutrition education, counseling, and internet-based approaches, but the strength of one versus the other in order to maximize the outcome could not be discerned in the literature. Dr. Campbell added that when quantitative data were available to evaluate dietary intake, the results were fairly consistent, and therefore, the strategies that are currently available are providing the same types of positive outcomes across each of these key settings.

Dr. Anderson suggested expanding the research recommendations to try and capture the totality of the environments in which people live, work, learn, and play. Dr. Story asked Dr. Anderson to provide some specific language for the SC to consider.

Subcommittee 5 (SC 5): Food Sustainability and Safety

Dr. Miriam Nelson, SC 5 Chair, began by acknowledging the Subcommittee members: Dr. Steven Abrams, Dr. Thomas Brenna, Dr. Frank Hu; Consultants: Dr. Timothy Griffin and Dr. Michael Hamm. Dr. Nelson also acknowledged Dr. Barbara Millen, Dr. Alice Lichtenstein, and staff for working with SC 5.

Dr. Nelson reported that SC 5 had not used any invited experts since the last meeting. Two Consultant SC 5 members, Timothy Griffin and Michael Hamm, continue to work with the Subcommittee.

Dr. Nelson reviewed the scope for SC 5 which was to address food and nutrition issues that inform public health action and policies to promote the health of the population through sustainable diets and food safety.

Dr. Nelson began by discussing the topic of sustainable diets and the need for dietary guidance to include the wider issue of sustainability. Emphasis was given to the importance of recognizing

the significant impact of foods and beverages on environmental outcomes, from farm to plate to waste disposal. It is important to have alignment in dietary guidance that promotes both health and sustainability to ensure food security for future generations.

Dr. Nelson shared that the food safety topics were chosen because of public health concern and recent evidence available that updates the knowledge base on health aspects related to coffee/caffeine and aspartame.

Dr. Nelson shared the list of SC 5 questions that would be summarized: 1) What is the relationship between population-level dietary patterns and long-term food sustainability?; 2) What are the comparative nutrient profiles of current farm-raised versus wild caught seafood?; 3) What are the comparative contaminant levels of current farm-raised versus wild caught seafood?; 4) What is the worldwide capacity to produce farm-raised versus wild caught seafood that is nutritious and safe for Americans?; 5) What is the relationship between usual coffee/caffeine consumption and health?; 6) What is the relationship between high-dose caffeine consumption and health?; 7) What is the relationship between aspartame consumption and health?; and 8) What consumer behaviors prevent food safety problems? The latter is a topic update from the 2010 DGAC.

Methodology

Dr. Nelson summarized the methodology utilized for the Committee's questions. Similar to other subcommittees, a variety of methods were used for the evidence review on the topics. The methods included the use of a Nutrition Evidence Library systematic review, existing reports, data analysis, and existing systematic review and meta-analyses. Content from the 2010 DGAC Report on consumer behaviors and food safety was brought forward and updated with information from the Food and Drug Administration (FDA) and Centers for Disease Control and Prevention (CDC).

Dr. Nelson next provided a summary of the major conclusions and recommendations from the Subcommittee. No substantive changes had been made since the work was previously reported in a public meeting.

Food Sustainability: Dietary Patterns

Dr. Nelson summarized the dietary patterns and sustainability conclusions and recommendations. A dietary pattern higher in plant-based foods, such as vegetables, fruits, whole grains, legumes, nuts, and seeds, and lower in animal-based foods is more health promoting and is associated with lesser environmental impact than is the current average U.S. diet. The U.S. population should be encouraged to move towards the dietary pattern noted above while decreasing overall total

calories. This can be achieved through a variety of dietary patterns, including the Healthy U.S.-style Pattern, the Healthy Vegetarian Pattern, and the Healthy Mediterranean-style Pattern. Each of these patterns provides more plant-based foods and lower amounts of meat than are currently consumed by the U.S. population. Sustainability considerations provide an additional rationale for following the *Dietary Guidelines for Americans*. The addition of environmental considerations to dietary guidance can be accomplished because of the compatibility and overlap between favorable health and environmental outcomes. It is important that both a greater shift toward healthful dietary patterns and an improved environmental profile are achieved to maximize food sustainability now and to ensure greater progress in this direction over time. Using sustainability messaging in communication strategies should be encouraged. Finally, careful consideration will be needed to ensure that sustainable diets are affordable for the entire U.S. population.

Dr. Nelson shared the research recommendations on the topic of sustainability and dietary patterns. The Committee suggested it is important to: 1) Conduct research to determine whether sustainable diets are affordable and accessible to all sectors of the population and how this can be improved, including how policy strategies could influence the supply chain (all steps from farm to plate) to affect this improvement; 2) Develop, conduct, and evaluate in-depth analyses of U.S. domestic dietary patterns and determine the degree to which sustainability practices are important to food choice and how to increase public awareness of the impact of food choices on environmental outcomes; 3) Develop a robust understanding of how production practices, supply chain decisions, consumer behaviors, and waste disposal affect the environmental sustainability of various practices across the food components of MyPlate; and 4) Determine the potential economic benefits and challenges to supply chain stakeholders in relationship to findings in research recommendation 3.

Food Sustainability: Seafood

Dr. Nelson shared the following conclusions for seafood and nutrient profiles. For commonly consumed fish species in the U.S. (such as salmon, trout, bass, and cod) farm-raised fish have as much or more omega-3 fatty acids, EPA and DHA, as the same species captured in the wild. Recommended amounts of EPA and DHA can be obtained by consuming a variety of farm-raised fish, especially high-trophic species, such as salmon and trout. It is recommended that the U.S. population be encouraged to eat a wide variety of seafood that can be wild caught or farmed, as they are nutrient-dense foods that are uniquely rich sources of healthy fatty acids. Dr. Nelson reported the conclusion on seafood and contaminants. For wild and farmed species, the risks of contaminants are similar and do not outweigh the health benefits of seafood consumption, such as decreased cardiovascular disease risk. It is recommended that based on risk/benefit comparisons, either farmed or wild caught seafood are appropriate choices to consume to meet *Dietary Guidelines for Americans* recommendations for seafood consumption.

On the topic of seafood sustainability, the Committee concluded that wild caught fish production has leveled off and farm-raised production has increased to meet increasing demand. Expanded seafood production will need to rely on the continued rapid increase in farm-raised output worldwide. Dr. Nelson shared with the Committee the implication that both wild caught and farmed seafood are major food sources available to support *Dietary Guidelines for Americans* recommendations to regularly consume a variety of seafood. Availability of these important foods is critical for future generations of Americans to meet their needs for a healthy diet.

Dr. Nelson showed a graph of the comparison of fishery production and aquaculture from 1950-2010. Both aquaculture and fishery production have gradually increased since 1950. Starting in 1990 fishery production levelled off and aquaculture continued to increase. In order to meet U.S. demand and world demand, aquaculture and fishery production will need to increase.

Dr. Nelson shared the research recommendations on the topic of seafood sustainability. It is recommended that research be conducted on methods to ensure the maintenance of nutrient profiles of high-trophic level farmed seafood and improve nutrient profiles of low-trophic farmed seafood concurrent with research to improve production efficacy. Additionally, it is important to develop methods to ensure contaminant levels in all seafood remain at levels similar to or lower than at present. The Committee recommended continued monitoring of contaminant levels for capture fisheries to ensure that levels caused by pollution do not rise appreciably. This research should include developing effective rapid response approaches if the quality of the seafood supply is acutely affected.

Food Safety: Coffee and Caffeine

Dr. Nelson presented a summary of the draft food safety conclusions and recommendations.

For the topic of usual caffeine intake and chronic and neurologic diseases, the Committee concluded that consumption of coffee within the moderate range (3 to 5 cups/day or up to 400 milligrams/day caffeine) is not associated with increased risk of major chronic diseases or premature death. In addition, moderate coffee consumption is associated with reduced risk of type 2 diabetes, cardiovascular disease, and liver and endometrial cancer. Also, moderate caffeine consumption is associated with reduced risk of Parkinson's disease. The Committee advised that moderate coffee consumption, because coffee is the primary source of caffeine in the U.S., can be incorporated into a healthy lifestyle, along with other behaviors, such as refraining from smoking, consuming a nutritionally balanced diet, maintaining a healthy body weight, and being physically active. It should be noted that coffee as it is normally consumed frequently contains added calories from cream, milk, and added sugars. Care should be taken to minimize these caloric additions.

Dr. Nelson presented draft conclusions and recommendations on usual caffeine intake and pregnancy outcomes. The evidence review showed that moderate caffeine intake in pregnant women is not associated with risk of preterm delivery. Additionally, limited evidence showed that moderate caffeine intake is associated with a small increased risk of miscarriage, stillbirth, low birth weight, and small for gestational age births. The evidence supports current recommendations to limit caffeine intake during pregnancy, as a precaution. The Committee recommended that women who are pregnant or planning to become pregnant should be cautious and adhere to current recommendations of the American Congress of Obstetricians and Gynecologists regarding caffeine consumption and not consume more than 200 milligrams caffeine per day (approximately two cups of coffee per day).

Dr. Nelson shared the research recommendations on the topic of usual caffeine intake. The committee recommended to: 1) Evaluate the effects of coffee on health outcomes in vulnerable populations, such as women who are pregnant (premature birth, low birth weight, spontaneous abortion); 2) Examine the effects of coffee on sleep patterns, quality of life, and dependency and addiction; 3) Evaluate the prospective association between coffee/caffeine consumption and cancer at different sites; 4) Examine prospectively the effects of coffee/caffeine on cognitive decline, neurodegenerative diseases, and depression; 5) Understand the mechanisms underlying the protective effects of coffee on diabetes and CVD; and 6) Understand the association between coffee and health outcomes in individuals with existing CVD, diabetes, cancer, neurodegenerative diseases, or depressive symptoms.

Dr. Nelson presented the draft conclusions and recommendations on high dose caffeine, specifically energy drinks. Evidence on the effects of excessive caffeine intake on the health of adults or children (>400 milligrams/day for adults; undetermined for children and adolescents) is limited. Some evidence links high caffeine intake in the form of energy drinks to certain adverse outcomes, such as caffeine toxicity and cardiovascular events. Mixing alcohol with energy drinks can mask the effects of alcohol intoxication, so an individual may drink more and increase risk of alcohol-related adverse events. The DGAC agrees with the American Academy of Pediatrics and the American Medical Association that until safety has been demonstrated, limited or no consumption of high-caffeine drinks, or other products with high amounts of caffeine, is advised for vulnerable populations, including children, adolescents, and young adults. High-caffeine energy drinks and alcoholic beverages should not be consumed together.

Dr. Nelson shared research recommendations on the topic of high caffeine and energy drinks. The Committee recommended to: 1) Define excessive caffeine intake and safe levels of consumption for children, adolescents, and young adults; 2) Determine the prevalence of excessive caffeine intake in children and adults beyond intake of energy drinks; 3) Examine the effect of excessive consumption of caffeine and energy drinks on health outcomes in both

children and adults; and 4) Conduct observational studies to examine the health effects of alcohol mixed with energy drinks.

Food Safety: Aspartame

Dr. Nelson next presented on the draft conclusions and recommendations on aspartame. The DGAC concurs with the European Food Safety Authority (EFSA) Panel on Food Additives that aspartame in amounts commonly consumed is safe and poses minimal health risk for healthy individuals without phenylketonuria (PKU). More long-term human studies need to be conducted to further assess a possible association between aspartame and risk of some hematopoietic cancers (non-Hodgkin lymphoma and multiple myeloma). The Committee recommended that if individuals choose to drink beverages that are sweetened with aspartame, they should stay below the aspartame Acceptable Daily Intake (ADI) of no more than 50 milligrams/kilogram/day (12-ounce diet beverage contains approximately 180 milligrams of aspartame). The Committee recommended that future research examine the risks of aspartame related to some cancers, especially hematopoietic ones, and pregnancy outcomes.

Food Safety Behaviors

Dr. Nelson stated that on the topic of food safety behaviors, the 2010 DGAC provided in-depth guidance on food-borne illness prevention. The 2015 Committee determined that the majority of the 2010 food safety guidance was current, and this was carried forward with minor updates.

Summary

Dr. Nelson summarized the Committee's work on sustainable diets and food safety. A diet higher in plant-based foods, such as vegetables, fruits, whole grains, legumes, nuts, and seeds, and lower in animal-based foods is more health promoting and is associated with less environmental impact than is the current U.S. diet. A moderate amount of seafood is an important component of many of the dietary patterns associated with improved health and sustainability. To supply enough fish, both farm-raised and wild caught fish will be needed. Farm-raised fish has as much EPA and DHA as wild caught, and the risks of contaminants do not outweigh the health benefits for either type. Moderate coffee consumption (3 to 5 cups/day or up to 400 milligrams/day caffeine) is not associated with increased long-term health risks among healthy individuals and may provide health benefits associated with chronic disease risk. Unfortunately, limited evidence is available to ascertain the safety of high caffeine intake, such as might occur with rapid consumption of large-sized energy drinks. Concern is heightened when energy drinks are combined with alcoholic beverages. At the level that the U.S. population consumes aspartame, it

appears to be safe. However, some uncertainty continues about increased risk of hematopoietic cancers, indicating a need for more research.

In conclusion, Dr. Nelson thanked the federal staff for the support and efforts throughout the process.

Discussion

Dr. Pérez-Escamilla asked how a moderate level of seafood intake is defined and stated that in 2010 the *Guidelines* encouraged a specific amount of seafood intake. Dr. Nelson responded that the seafood intake amount was not addressed by SC 5 questions. The data from the evidence review support the three patterns recommended by the Committee.

Dr. Neuhouser suggested that the Committee incorporate the fact that seafood is produced internationally into the research recommendations. Dr. Nelson agreed.

Dr. Adams-Campbell asked for clarification on the evidence stating that moderate caffeine intake in pregnant women is not associated with risk of preterm delivery but is associated with small increased risk of other adverse pregnancy outcomes. Dr. Hu responded that there was a recent meta-analysis on caffeine intake but the evidence was limited to preterm delivery outcomes.

Dr. Campbell asked if the terms caffeine and coffee are being used interchangeably. Dr. Hu responded that coffee is the main source (about 80 percent) of caffeine in the U.S. Most of the studies in the evidence review looked at coffee. Dr. Campbell wanted to make sure that the recommendation was not encouraging caffeine from sources other than coffee since the evidence was on coffee. Dr. Lichtenstein agreed that the implications should be focused on coffee since that is what the evidence was based on. Dr. Campbell asked if there should be a cautionary note on the potential for dependency. Dr. Hu clarified that the implication stated that coffee “can,” not “should” be consumed at a moderate level. Dr. Neuhouser suggested that the evidence was not specific enough on caffeine to add a caution since most of the evidence was on coffee. The Subcommittee discussion was concluded.

Science Base Chapter: Cross-Cutting Topics of Public Health Importance

Dr. Alice H. Lichtenstein, DGAC Vice-Chair, introduced the cross-cutting topics of public health importance, which are sodium, saturated fat, and added sugars. The *2010 Dietary Guidelines* identified sodium, saturated fat, and added sugars as nutrients of concern, and the 2015 Committee determined that a reexamination of the evidence on these topics was necessary to evaluate whether revisions to the guidance were warranted. These topics were considered to

be of public health importance because each has been associated with negative health outcomes when over-consumed. Additionally, the Committee acknowledged that a potential unintended consequence of a recommendation on added sugars might be that consumers and manufacturers replace added sugars with low-calorie sweeteners. As a result, the Committee also examined evidence on low-calorie sweeteners to inform statements on this topic.

Dr. Lichtenstein remarked that sodium, saturated fat, and added sugars were topics that did not reside in a single subcommittee. As a result, working groups were formed with representatives from relevant subcommittees to ensure that topics were addressed using a cross-cutting approach. Although sodium, saturated fat, and added sugars are receiving particular focus, it is important to consider potential changes in intake within the context of a healthy dietary pattern.

Dr. Lichtenstein turned the presentation over to Dr. Cheryl Anderson, the Sodium Working Group (SWG) Lead, to discuss the first cross-cutting topic, sodium.

Dr. Cheryl Anderson acknowledged the other members of the SWG, Dr. Wayne Campbell, Dr. Steven Clinton, and Dr. Lichtenstein. Dr. Anderson summarized the rationale for looking at sodium in a cross-cutting way and the four questions addressed by the SWG. There were no substantive changes to the work previously reported in a public meeting. In summary, the Committee concluded that the relationship between higher sodium intake and increased blood pressure is supported by strong evidence and that moderate evidence suggests a relationship between higher sodium intake and increased risk of cardiovascular disease. The Committee also concluded that there is inconsistent and insufficient evidence for lowering sodium intakes below 2,300 milligrams/day and that there is insufficient evidence regarding the relationship between potassium intake and blood pressure.

Dr. Anderson concluded the presentation by summarizing the major recommendations of the Committee. For the general population ages 2 years and older, the Committee recommends relying on the recommendations of the Institute of Medicine (IOM) Panel on Dietary Reference Intakes for Electrolytes and Water, specifically the Tolerable Upper Intake Levels (ULs) for the appropriate age group. Individuals who would benefit from blood pressure lowering, i.e., those with prehypertension and hypertension, should rely on the recommendations in the 2013 American Heart Association/American College of Cardiology (AHA/ACC) Lifestyle Report. In addition, the Committee recommends that a primary emphasis should be placed on policies and population-based strategies for sodium reduction while at the same time paying attention to consumer education.

Dr. Frank Hu, the lead of the Saturated Fat Working Group (SFWG) presented the second cross-cutting topic, saturated fat, and acknowledged the members of the SFWG: Dr. Tom Brenna, Dr. Alice H. Lichtenstein, and Dr. Barbara Millen. Dr. Hu acknowledged that there were

no substantive changes since the work was previously reported in a public meeting. Dr. Hu pointed out that a central issue in the relationship between saturated fat and cardiovascular disease is the specific macronutrients used to replace saturated fat because consuming unsaturated fats versus carbohydrates in place of saturated fat can have different effects on blood lipids and risk of cardiovascular disease. Thus, the Committee's assessment of the available evidence puts greater emphasis on the replacement macronutrient for saturated fat. In summary, the Committee concluded that strong evidence suggests replacing saturated fat with unsaturated fats, especially polyunsaturated fats, reduces LDL cholesterol and cardiovascular disease risk. The Committee also concluded that there is strong evidence that replacing saturated fat with overall carbohydrates does not lower cardiovascular disease risk and that there is limited evidence for replacing saturated fats with monounsaturated fats.

Dr. Hu ended the presentation by summarizing the major recommendations of the Committee, one of which is a recommendation to specify replacement macronutrients and emphasize the replacement of saturated fat with unsaturated fats, especially polyunsaturated fats. The Committee also recommends retaining the 10 percent upper limit of daily calories from saturated fat intake.

Dr. Mary Story presented the last cross-cutting topic on behalf of the Added Sugars Working Group (ASWG) and acknowledged co-lead Dr. Miriam Nelson, along with the other members of the ASWG: Dr. Cheryl Anderson, Dr. Wayne Campbell, Dr. Frank Hu, Dr. Alice H. Lichtenstein, Dr. Barbara Millen, and Dr. Marian Neuhouser. Dr. Story stated that the *2010 Dietary Guidelines* included guidance stating that, for most people, no more than about 5 to 15 percent of calories from solid fats and added sugars (combined) can be reasonably accommodated in a healthy eating pattern. The 2015 Committee decided to uncouple solid fats and added sugars and examined them separately. Dr. Story summarized how food pattern modeling was used to evaluate the amount of added sugars that could be consumed while meeting food and nutrient needs. In addition to food pattern modeling, the Committee reviewed scientific literature examining the relationship between the intake of added sugars and health outcomes to inform recommendations. Dr. Story summarized the questions addressed by the ASWG and noted that there were no substantive changes since the work was previously reported in a public meeting.

In summary, the Committee concluded that there is strong evidence that added sugars, especially sugar-sweetened beverages, increase the risk of excess body weight, obesity, and type 2 diabetes. There is moderate evidence for an increased risk of hypertension, stroke, and coronary heart disease; higher blood pressure and serum triglycerides; and dental caries. For low-calorie sweeteners, the Committee concluded that there is moderate evidence for replacing sugar-containing sweeteners with low-calorie sweeteners for reducing calorie intake, body weight, and adiposity in short duration studies. There is limited and inconsistent evidence of an association

between low-calorie sweeteners and long-term body weight control and risk of type 2 diabetes. Dr. Story concluded by summarizing the Committee's major recommendations, one of which is a recommendation to limit added sugars to a maximum of 10 percent of total daily caloric intake.

Dr. Lichtenstein provided a summary of the chapter and stated the goals for the general population: less than 2,300 milligrams dietary sodium per day (or age-appropriate Dietary Reference Intake amount), less than 10 percent calories from saturated fat per day, and a maximum of 10 percent of total calories from added sugars per day. Dr. Lichtenstein also thanked the federal staff who assisted with the development of this chapter.

Discussion

Dr. Neuhouser raised an issue for consideration by the SFWG. The evidence for the substitution of saturated fat was strong and consistent, yet having read the evidence summary in the chapter, Dr. Neuhouser felt the conclusion was stronger than warranted. Dr. Neuhouser gave an example of the conclusions in the Mensink and Katan papers and asked if the results were clinically meaningful; readers might be confused by the small effect sizes and suggested the SFWG provide more clarification. Dr. Hu noted that the Committee's conclusions were primarily drawn from the AHA/ACC report which did an extensive review of randomized controlled trials and found that the replacement of saturated fat with carbohydrate is consistently associated with increased triglycerides and decreased HDL. Dr. Neuhouser pointed out that this was not presented in the text. Dr. Lichtenstein agreed that this is a very important point and was glad Dr. Neuhouser brought up the issue. The SFWG will review the text accordingly and make the necessary edits.

Dr. Lichtenstein turned the podium over to Dr. Nelson to present on the work of the Physical Activity Writing Group.

Physical Activity Writing Group (PAWG)

Dr. Miriam Nelson, PAWG Chair, began the presentation by introducing two key themes from the physical activity writing group's work. First, the combination of a healthy diet and regular physical activity is central to promoting overall health and preventing many chronic diseases; and second, physical activity is important for all people—children, adolescents, adults, older adults, women during pregnancy and the postpartum period, and individuals with disabilities.

Dr. Nelson summarized the questions addressed by the PAWG by major topic areas: physical activity dose (3 questions), physical activity and health outcomes in children and adolescents (1 question), physical activity and health outcomes in adults (6 questions), physical activity and health outcomes in people with disabilities (1 question), physical activity during pregnancy and

the postpartum period (1 question), physical activity and adverse events (1 question), and physical activity interventions in children and adolescents (5 questions). Dr. Nelson went on to note that the PAWG's questions were addressed using three existing publications: *Physical Activity Guidelines Advisory Committee Report, 2008*; *Physical Activity Guidelines for Americans, 2008* (PAG); and *Physical Activity Guidelines for Americans Midcourse Report: Strategies to Increase Physical Activity Among Youth*.

Dr. Nelson provided an overview of the recommended doses of physical activity for various age groups as described in the PAG. Children and adolescents (ages 6 - 17 years) should do 60 minutes or more of physical activity daily. Most of the 60 or more minutes a day should be either moderate- or vigorous-intensity aerobic physical activity, and should include vigorous-intensity physical activity at least 3 days a week. As part of their 60 or more minutes of daily physical activity, children and adolescents should include muscle-strengthening physical activity on at least 3 days of the week. As part of their 60 or more minutes of daily physical activity, children and adolescents should include bone-strengthening physical activity on at least 3 days of the week.

Dr. Nelson continued by describing the recommended physical activity dose for adults and older adults. Adults should do at least 150 minutes (2 hours and 30 minutes) a week of moderate-intensity aerobic physical activity OR 75 minutes (1 hour and 15 minutes) a week of vigorous-intensity aerobic physical activity OR an equivalent combination of moderate- and vigorous-intensity aerobic activity. For additional and more extensive health benefits, adults should increase their aerobic physical activity to 300 minutes (5 hours) a week of moderate intensity OR 150 minutes a week of vigorous intensity aerobic physical activity OR an equivalent combination of moderate- and vigorous-intensity activity. Adults should also do muscle-strengthening activities that are moderate or high intensity and involve all major muscle groups on 2 or more days a week. When older adults (65+ years) cannot do 150 minutes of moderate-intensity aerobic activity a week because of chronic conditions, they should be as physically active as their abilities and conditions allow. Older adults should do exercises that maintain or improve balance if they are at risk of falling. Older adults should determine their level of effort for physical activity relative to their level of fitness.

Next, Dr. Nelson reviewed the PAWG's major findings and conclusions. Being physically active is one of the most important steps that people of all ages can take to improve and maintain their health. All individuals should avoid physical inactivity, and the majority of the U.S. population does not meet physical activity recommendations. Compared to less active counterparts, physically active people have improved growth and development, higher levels of fitness, a lower risk profile for developing a number of disabling medical conditions, and lower rates of various chronic diseases. Finally, Dr. Nelson notes the importance of ensuring all individuals

have access to safe, affordable, and enjoyable modes of physical activity throughout the day in the environments where they live, learn, work, and play.

Dr. Nelson concluded with a summary of the physical activity chapter. There is strong evidence supporting the importance of regular physical activity for health promotion and disease prevention in the U.S. population. Moreover, given the low physical activity participation rates in this country, it is critically important to identify proven strategies and approaches to increase population-level physical activity across the lifespan.

Dr. Nelson thanked key support staff and fellow writing group members and emphasized her hope that the government will develop future editions of the *Physical Activity Guidelines for Americans*.

Drs. Lichtenstein and Campbell did not provide additional comments. There were no Committee member questions.

Integration of Findings

Dr. Barbara Millen, Chair of the DGAC, described the integration of findings from the Committee's report. The Committee focused on a number of themes at the beginning that were refined as the work progressed. These included: What are the Nation's most serious health and nutritional problems? What population health and nutrition disparities exist? How do overall dietary patterns link to health and disease? What solutions exist to solve these problems (that is, evidence of 'what works') at individual and population levels? How do we achieve food security and sustainability now and for future generations? How do we take a 'systems approach' in order to find the broadest set of solutions to the Nation's food, nutrition and health problems? In this presentation, Dr. Millen summarized the overarching themes that have emerged from the Committee's research that are reflected in its conclusions and recommendations.

Dr. Millen described health problems in the U.S. There are high rates of diet-related chronic diseases including CVD, hypertension, type 2 diabetes, and certain cancers. Half or more of American adults, 117 million individuals, have one or more of these preventable, diet-related health problems. Also, two-thirds of adults and nearly one-third of children are overweight or obese, conditions that exacerbate chronic diseases and their co-morbidities. These conditions have persisted for 25 or more years. In terms of health disparities, all of these conditions disproportionately affect low income and underserved populations. Importantly, the high and persistent rates of these conditions have focused the services of our health care delivery system on treatment in high-risk individuals rather than prevention strategies in the broader population. These problems are a call to action. The best evidence-based solutions at individual and population levels need to be applied to address them. Attention must also be given to less

common but important diet-related health problems, including dental caries, bone health problems, and neurocognitive disorders.

Dr. Millen described the gaps that exist. Dietary patterns of Americans, including food and nutrient intake, fall short of expert recommendations. In particular, diets are low in vegetables, fruit, and whole grains, and high in sodium, saturated fat, refined grains, added sugars, and calories. Based upon dietary and biomarker data (where available), the Committee identified vitamin D, calcium, potassium, and fiber as ‘under-consumed’ nutrients of concern for most Americans and iron a concern for adolescents and premenopausal women. Sodium, saturated fat, and added sugars were identified as over-consumed nutrients based upon dietary data.

One can ask what difference these dietary characteristics make. Across the body of data reviewed by the Committee (particularly Subcommittee 2), there are moderate to strong relationships between these dietary patterns and a wide variety of health outcomes. Poor diet is not only related to the major chronic diseases but has an impact on intermediate markers as well, involving the vast majority of adults and, increasingly, children. These gaps provide compelling calls for action.

There is striking consistency across healthy dietary patterns. There is moderate to strong evidence linking common components to a wide variety of chronic diseases, intermediate markers of disease risk, and other health outcomes including total mortality. The healthy patterns are high in vegetables, fruits, whole grains, low-fat dairy, seafood, legumes, and nuts; moderate in alcohol; lower in red and processed meats; and low in added sugars and refined grains.

The Committee recommended that subcategories of nutrients be looked at as well.

The cross-cutting workgroups also recommended that within healthy dietary patterns, set upper limits on saturated fat (10 percent of total energy), sodium (2,300 milligrams for the general population), and added sugars (10 percent of total energy). They also noted that the dietary focus be placed on substituting polyunsaturated fats for saturated fats (rather than the macronutrient composition of the diet) and adhering to a level of calories that achieves and maintains a healthy body weight.

There was also a convergence of research findings which indicate that, based upon state-of-the-art modeling techniques, the healthy dietary pattern is also one that is associated with important, favorable environmental outcomes (including land and water use and greenhouse gas emissions). Thus, healthy dietary patterns are sustainable dietary patterns. We know what dietary patterns to promote, and we have health and environmental motivations.

Dr. Millen described what works to achieve a healthy lifestyle. The healthy dietary pattern is not achieved with a single prescriptive formula. Rather, the Committee modeled several patterns that

are strongly supported by the research evidence and meet desirable nutrient and health profiles. These include: the Healthy U.S.-style Pattern, the Healthy Mediterranean-style Pattern, and the Healthy Vegetarian Pattern. In terms of weight loss, 15 dietary patterns were found to be equally effective in short- and long-term weight loss, as long as calorie restriction was achieved. Consumers and clinicians now have many more truly evidence-based options. Recognize, however, that from a health perspective, some patterns may be more beneficial in terms of metabolic or health risk characteristics. Therefore, the Committee recommends that diets be ‘personalized’ to the health needs, dietary preferences, and cultural traditions of the individual. Education and counseling at individual and population levels should take these approaches and be guided by evidence-based strategies reported on by the Committee.

Regular physical activity should be combined with diet to achieve a favorable health outcome. At the individual level, many targeted strategies were identified by the Committee and are evidence-based, like family-shared meals and decreasing sedentary behavior and screen time, particularly in children.

In order to enhance the impact on chronic disease risk and weight management, the Committee found that counseling by nutrition professionals and comprehensive lifestyle interventions by trained professionals (nutritionists, exercise specialists, and behaviorists) achieved maximal effects. At the population level, just as with individual level change, the greatest impact is seen with targeted environmental and policy changes and standards, collaboration across systems and sectors, and, in the case of children, engagement of parents and families.

The overall aim of the 2015 Committee’s recommendations is to create a culture of health in the U.S. Dr. Millen described how the evidence base guides this and what it will take to achieve this at individual and population levels.

Population health needs to become a true national priority, if not a human right. This will require paradigm shifts at many levels. Healthy lifestyle approaches need to become easy, accessible, affordable, and normative. Health care and public health professionals must take leadership roles and become models of prevention in their healthcare systems and practices. Healthcare would shift towards a greater focus on prevention. Providers would convey the importance of prevention to their patients, set model standards for prevention-oriented activities and services in their institutions and networks, and refer patients to nutrition counseling and comprehensive lifestyle services (including nutrition, physical activity and lifestyle behavior change) as needed. Preventive services would be incentivized and reimbursed and become a part of routine employee benefit and health insurance packages. Collaborations would occur across societal sectors to promote population health. New policies, standards, and programs would emerge. Preventive lifestyle programs and services would be incentivized in other public and private settings such as pre-school settings, K-12 school settings, and worksites.

Dr. Millen shared the Committee's numerous recommended actions for individual and population levels. For individuals, the recommendations are to take action to promote personal and household/family health. The public should think prevention and know its health risks and learn how lifestyle affects health risks. In addition, it is important to understand how weight status relates to health. Individuals should make commitments, take personal action, and seek preventive lifestyle services in health care. They should work with providers and find sound tools and resources like the *Dietary Guidelines* and others on-line and in their community and networks.

It is important for the public to take an active role in its own health and communicate on prevention with health advisors. The Committee recommended that individuals understand their current dietary pattern and how their physical activity compares to expert guidelines. It is important to learn the strengths and limitations of dietary patterns and what can be retained or modified. Achieving a healthy dietary pattern starts with preferences and healthier habits as a base. Individuals are encouraged to seek to understand how their dietary pattern and physical activity relate to their personal health profile. The Committee recommends achieving a healthy dietary pattern through healthy foods and beverages rather than nutrient or dietary supplements. Select from one of the sound healthy dietary pattern options and tailor it to needs and preferences. Aim to target behaviors like eating out less, reading food labels, and making smarter decisions, such as modifying recipes to be healthier.

Dr. Millen next recommended the following actions for communities and populations. Aim to make healthy lifestyles and prevention a national and local priority and reality. This will entail multi-sectorial collaborations and community involvement. Seek policy changes that incentivize collaborations between health care, public health, education, food and agriculture, transportation, retail, non-governmental organizations (NGOs), and service sectors. Expand existing evidence-based models and achieve others.

Seek a paradigm shift in health care and public health toward a greater focus on prevention and integration with food systems. Health care settings should be a model in which patients have access to healthy foods and initiatives, including evidence-based individual and group programs that promote healthy eating and physical activity.

Dr. Millen continued by saying incentives will be needed to promote such services and to make them a standard, reimbursed feature of health care benefits. Seek financing for preventive services and incorporate them into healthcare, legislation and quality standards. Incentivize businesses to provide positive employee health benefits that encourage engagement in preventive lifestyle programs and services for personal health promotion.

Establish healthy food environments (e.g., schools, worksites, and early childcare settings). This will require strong leadership, new policies, and standards that affect food services, vending, leisure time activities, and preventive lifestyle programs and services. Make healthy foods more available in retail and public places. Limit sugar, sodium, and saturated fat. Incorporate nutrition curricula in schools and new opportunities for physical activity. Involve parents and families. Make drinking water available. Improve standards for food packaging and labeling. Align food assistance programs with the *Dietary Guidelines* and acknowledge their role in shaping behaviors of participants and their families and households. Encourage industry to reformulate products in keeping with the new *Dietary Guidelines*.

Dr. Millen continued by stating that additional actions for communities and populations include supporting and expanding access to healthy built environments and advocating wide community use. The Committee recommends maintaining strong support for Federal food and nutrition programs and recognizing and placing priority on moving toward a more sustainable diet consistent with the healthy dietary pattern options. It is important to provide access to sufficient, nutritious, and safe food as an essential element of food security for the U.S. population. A sustainable diet helps ensure this access for both the current population and future generations.

Dr. Millen concluded the summary of the integration of findings by stating that strong leadership is needed at all levels to achieve these goals but particularly in healthcare, industry, and the public sectors.

Closing Remarks

Dr. Barbara Millen, Chair of the DGAC, stated it was really a challenge to keep pace with all of the subcommittees and working groups and thanked the extraordinary staff who supported the work and members of the Committee. Dr. Millen said it was a wonderful challenge to think about and compile the integration of findings, particularly when there is a story like this to tell. There are incredible problems and huge gaps, but there are solutions and an evidence base that have never been stronger. There are models at the individual, household, school, pre-school, work site, policy, and corporation levels. This demonstrates that different sectors and stakeholders can come together. When they do, the effects are tremendous. One has to consider that the problems are not new. They have been difficult to change; they have been here for two and a half decades or more. The urgency is tremendous. This is a call for tremendous leadership. The Committee is presenting a solid base of evidence and wonderful models and will continue to work with others to implement them. The Committee looks forward to reading the policy report at the end of 2015 to see the translation of this work into public policy.

Dr. Millen thanked the staff and said each of the working group and subcommittee leads today acknowledged the staff, but the Committee's work could not have been done without them. It has

been an extraordinary collaboration. It is a complete report. It is stronger than ever envisioned. It is a tribute to the support staff and the absolute dedication of this Committee. A day did not pass without somebody asking if there were time to consider one more question, whether one more Nutrition Evidence Library review could be done, because such and such was an important topic and the list of questions expanded the scope. The evidence was presented and everyone has a lot to be proud of. The Committee hopes that it does the job and provides what the Departments of Agriculture and Health and Human Services need to make a very strong set of policy initiatives and documents for the nation. Thank you.

Dr. Millen stated that during the Committee's discussion today, there were no major changes recommended in any of its conclusion statements or recommendations. The Committee does not need to go back to another several weeks of work. Dr. Millen called for a vote, in a motion to basically move the DGAC Report forward as the Committee discussed it today.

There was a second to the motion and Dr. Millen took a show of hands. The vote was unanimous.

Dr. Richard Olson thanked Dr. Millen and stated that there would be some remarks from HHS's Acting Assistant Secretary for Health. Dr. Olson introduced Dr. Don Wright.

Dr. Don Wright, Deputy Assistant Secretary for Health Promotion and Disease Prevention, thanked Dr. Olson and said it was a distinct privilege to introduce the newest member of the Federal family, HHS's new Acting Assistant Secretary for Health, Dr. Karen DeSalvo. Dr. Wright started with a personal remark, that the two of them had something in common. Both are Texas natives, but Dr. DeSalvo has been successful at shedding her accent and he has not. Dr. Wright had to clarify that up front. Dr. DeSalvo went north. She attended Suffolk University, after which time she turned back to the south and went to New Orleans and did her medical degree, residency training, and also her Masters of Public Health at Tulane University and Tulane Hospital. From there she went to academia as a member of the faculty and then became Vice Dean for Community Affairs and Health Policy at Tulane. She had a significant change of professional seasons, because in the aftermath of Hurricane Katrina, the Mayor of New Orleans asked Karen if she would leave her position at Tulane and become the city's Health Commissioner and help with the rebuilding effort.

Dr. Wright continued by noting that Dr. DeSalvo markedly improved public health and health care delivery in New Orleans and in the area around New Orleans in the aftermath of Katrina. She stayed there until she got a call from Washington that occurred 11 months ago, when Secretary Sibelius and the President asked her to come to Washington to lead the office of the National Coordinator for Health Information Technology (IT). That office is very much at the forefront of health information technology and implementation that many have heard about.

Several weeks back the Secretary asked her if she would wear a second hat that of the Acting Assistant Secretary for Health. It shows Karen's energy and enthusiasm to be able to wear both of those hats simultaneously. As the Assistant Secretary for Health, she is responsible for overseeing the work of ten program offices, including my office, the Office of Disease Prevention and Health Promotion.

Dr. Wright stated that as one could see, Dr. DeSalvo has a very vast portfolio just in the Office of the Secretary for Health, not to mention continuing her role as the National Coordinator for Health IT. Dr. Wright said he could go for an extended period of time to talk about the awards she received and other credentials, but he would not do that because she is a busy individual. Dr. Wright turned the podium over to Dr. Karen DeSalvo.

Dr. Karen DeSalvo, Acting Assistant Secretary for Health, thanked Dr. Wright and said it has been a joy to get to know him and his entire team. They are all a really tremendously talented group of individuals that she is looking forward to getting to know better. She said she does not often use prepared remarks when she speaks; on the other hand, Dr. Wright's team has done a terrific job of capturing remarks. Dr. DeSalvo noted that if time allows, she would share some points. First, Dr. DeSalvo thanked the Committee and offered congratulations on the tremendous work that it accomplished over the last many months. She thanked HHS staff, those at USDA, members of the public, and the many people who are watching today and who have been following this process with great interest. Good nutrition is critical to building a foundation for a strong, healthy, vibrant nation where every child, every person has the opportunity for a rich quality of life free of disease. Improving the nation's diet is an essential ingredient to improving public health, and through the *Dietary Guidelines for Americans* aim to do just that.

As a doctor, Dr. DeSalvo sees this firsthand and, in fact, did see this last weekend in a clinic in New Orleans, the burden of poor nutrition on chronic disease that so many people suffer in this nation. She sees school-age kids who are developing type 2 diabetes. Young adults with high blood pressure and high cholesterol are at risk for cardiovascular disease. Dr. DeSalvo sees it in mothers and fathers, grandmothers and grandfathers suffering from nutrition-related cardiovascular disease and cancer that take years of life away from them. Dr. DeSalvo is committed to changing this, together with the Committee and others. The U.S. has the ability to be the healthiest nation in the world in one generation. Population health must be addressed through broad attention not only to lifestyle behaviors, such as diet, but also physical activity. Dr. DeSalvo stated that as she looked around the room she saw catalyst for change: people who, being scientists, health care providers, professors, all national experts, volunteered countless hours in the past many months. The work provides Americans with the best evidence and advice on nutrition, diet, and overall health.

Dr. DeSalvo said the Committee's contributions will strengthen the future edition of the *Dietary Guidelines for Americans* and will have momentum to help in policies and approaches to help make the healthy choice the easy choice. Those in public health, and individuals, no matter where they live or their income, no matter the color of skin or what kind of insurance they have, will be forever grateful. Because of the work of this Committee, HHS and the USDA will be equipped with a rigorous report to allow development of a new edition of the *Dietary Guidelines*, one that is based on the best available science.

Dr. DeSalvo stated that the report and the forthcoming *Dietary Guidelines for Americans* in 2015 will help focus resources and efforts in areas to make the greatest impact. These are areas where science can be translated into programs and information that catalyze change in communities across the country, in areas where health inequities can be lowered and health outcomes can be improved for everyone.

At HHS, the *Dietary Guidelines* provide a road map for the nutrition advice that is delivered through educational initiatives, through chronic disease prevention efforts, and through changing the health care and health system. The Committee's focus on prevention reflects HHS's focus, and the Committee's work will help shape the way the nation is served for years to come.

On behalf of Secretary Burwell and HHS, Dr. DeSalvo noted she looks forward to receiving the final 2015 Dietary Guidelines Advisory Committee Report and the valued advice provided within. The Committee members' help was enlisted, because HHS and USDA want to learn what is and is not working to improve our nation's nutrition and health. The knowledge and insight support efforts to increase access to healthy, affordable meals for everyone. Dr. DeSalvo said HHS is capable of addressing health in all policies and improving health by addressing diet and nutrition. The 2015 *Dietary Guidelines for Americans* will have the potential to promote the healthiest nation. Dr. DeSalvo challenged everyone in the room, as well as those watching on the live webcast, to think about what can be done to deliver impact in this area. She challenged all to act using the best available science as a guide. Change is good but is also hard. Together our nation can overcome the burden of chronic disease and premature mortality. Dr. DeSalvo congratulated the Advisory Committee, the catalyst for the kind of change needed as a country. The Committee's work makes everyone proud. Dr. DeSalvo thanked the Committee for taking time to advance health in our country.

Dr. DeSalvo stated the Committee is at the forefront and is why public health officials rely on the collective impact model, because it cannot be done alone, should not be done alone, and should be done together. She thanked the Committee again and added one final comment about culture change. Since Dr. Millen was just mentioning it, "it is important to know the science, it is important to follow the science, but we also know that just making the right choice easy is not going to get us where we need to be. Sometimes that does require us to have a conversation as a

country, as a community, to discuss how to evolve that culture.” Though the work of the group is done, she tasked the Committee experts in this area to help us understand the future, how will we know the best ways to change culture, not taking away what is great about it, not taking away from communities what matters, but helping to add to communities so they are healthy.

She comes from New Orleans where they do love their food. As a health commissioner in New Orleans, talking about better nutrition and better health for our kids was a challenge because of the rich history and family tradition and festivals and music that are predicated on food. In many cases, delicious food is made more delicious by some unhealthy choices. So working as a local community was not just about following the science. In terms of food and nutrition, they had to consider how expectations would affect culture and how culture would affect policies and programs, and how this would be a symbiotic relationship. Dr. DeSalvo stated: “We must be respectful of culture and diverse expectations in this spectacular country. I do believe that we can find a way to advance. In New Orleans, prior to me leaving, I had the chance to have lunch at one of our storied institutions, a local neighborhood restaurant. I saw on the chalkboard that in addition to some of the more traditional meals they had listed, they were now serving brown rice, and I thought that was a symbol of culture change. I am confident if we can do it, the whole country can.”

Dr. DeSalvo thanked the Committee again for their time and great work.

Dr. Alice H. Lichtenstein, Vice Chair, took the opportunity to make closing remarks.

Someone recently reminded her that one of the comments she made during the first Dietary Guidelines meeting was that the 2015 *Dietary Guidelines* were not going to be like grandma's guidelines. Dr. Lichtenstein said she suspects that is actually true and probably it is appropriate. However, she hopes as the 2015 *Dietary Guidelines* are developed and released that they will be translated into simple clear guidance that will provide a general road map for what we should be eating in terms of food, and that that will benefit the majority of Americans. Throughout the report we stress the importance of how the *Dietary Guidelines* must be adaptable to personal preferences and cultural traditions, ethnic customs, and therapeutic needs.

As such, Dr. Lichtenstein sincerely hopes the 2015 *Dietary Guidelines* will provide a clear unifying set of recommendations that will be embraced by both Americans and policy makers. When the Report is submitted to the agencies, the Committee will look forward and not backwards and acknowledge, on the basis of new data, there may be modifications to 2020 guidelines when they are released. This would not be because the Committee was necessarily wrong but because the field of nutrition moves forward, particularly with the recent advances in analytical methodologies, and knowledge about the relationship between food and health outcomes changes. Also, as available types of foods shift, as seen frequently in the marketplace, the guidance will need to shift to remain relevant.

At times Dr. Lichtenstein has been frustrated by lack of evidence, or the plethora of inconsistent evidence on a given topic, that precluded the Committee from making more precise recommendations. Looking forward, in the future, this will change for the better. Some will embrace and some will criticize. Dr. Lichtenstein has confidence that those formulating the 2015 *Dietary Guidelines* will find an evidence base broad-reaching and helpful. The process that was used to complete the 2015 Dietary Guidelines Advisory Committee (DGAC) report was transparent. The Committee benefited from the remarkable Federal staff dedicated and committed to helping each of the DGAC members maintain the highest standard and provide support beyond what she ever imagined would be available. Their high level of professionalism and competence was truly without exception. The DGAC also benefited from the hundreds of public comments that were submitted to inform the Committee and acknowledge the enormous amount of time and effort that went into writing them.

For all that, and additional support that Dr. Lichtenstein may have forgotten to highlight, she spoke from the whole Committee saying that they are immensely grateful. Dr. Lichtenstein said it was an extraordinary pleasure to work with all Dietary Guidelines Advisory Committee members, some of whom she worked with before, some of whom she had not. Each brought a certain level of expertise and knowledge that was tremendously valuable to deliberations. One of the best things about working on these kinds of committees is more what you learn from the other committee members. Dr. Lichtenstein noted that her knowledge about a tremendous number of areas has grown on the basis of working with the members. Dr. Lichtenstein is very grateful and thanked the Committee members.

Dr. Kellie Casavale, Co-executive Secretary, stated that everybody in the room knows her but for the benefit of those watching the webcast, she introduced herself as Kellie Casavale and was honored to be one of the Co-Executive Secretaries to the 2015 Committee. Dr. Casavale reviewed the next steps. This is the last public meeting of the Committee. Public comments will continue to be received via the public comments database on Dietaryguidelines.gov through December 30th. The comments have been available to the Committee throughout the process. Since the Committee decided today to set forth its report, the new comments will be more like an FYI (for your information). The Committee will not be able to act on them. If there is clarity or something needs to be tweaked, that is a small thing, and the Committee can act on those. The Federal Register notice listed December 30th as the day the public comments database will close. Though it will be closed, the public will be able to still go there and read the comments that were recently received by the Committee throughout the entire process.

Dr. Casavale stated that the next step is for the Committee's Report to be formally submitted to the Secretaries of Agriculture and HHS. It will take a number of weeks from today to make that happen, sometime in early January. The Charter states the Committee officially disbands when

the Report is received by the HHS and Agriculture Secretaries. It will take staff a number of weeks after that to make the final report 508 compliant. The law and requirements must be met to be able to post it online. So from a public perspective, be on the lookout for the Federal Register notice and keep an eye on dietaryguidelines.gov. The Federal Register notice will announce three things: 1) availability of the final report on the website; 2) a new public comment period that will be approximately 45 days, opening publicly perhaps in late January or early February, when the Federal Register notice posts (at that time, instead of commenting to the Committee, the public is now commenting to the Federal Government to give thoughts on the Committee's final report); and 3) a date for the public comment meeting where one will be able to register online to come in person and give oral testimony to the panel of Federal officials. From that time on, staff will gather Agency comments on the Committee's final report, including those from HHS and USDA. Once public comments are received, the Federal Government will then actually develop the *Dietary Guidelines for Americans 2015* policy document that will be released by the end of the next calendar year. That is the goal. The advice of the Committee in its report will be used, and as well as the comments that come from the public and the Federal agencies on the Report. Dr. Casavale turned the floor over to another Co-Executive Secretary, Ms. Colette Rihane, a colleague and friend.

Ms. Colette Rihane, Co-executive Secretary, exclaimed she cannot believe we are at this point. Ms. Rihane wanted to make a few remarks, many of which have already been said. She wanted to say the *Dietary Guidelines* process really is a five-year process. The work contributed over the last 18 months is huge. It is one phase of four or five phases in the whole process that is done for the *Guidelines* each time, and it is one of the most important pieces. When the process is started, it is a huge, looming, daunting task but all have come together through cooperation, teamwork, dedication and commitment; all have given so much. Ms. Rihane thanked the Committee for all the hard work it has done – its knowledge, expertise, and all the work over the past year and a half and all the free time it donated, time that it was not compensated for. She wanted them to know it is acknowledged that the members have full time jobs, and this shows dedication. Ms. Rihane acknowledged the three consultants who were mentioned a few times today who played a very important role. Their work helped fill the gaps in expertise that the Committee identified.

Ms. Rihane acknowledged the leadership, the policy officials, and the Co-Executive Secretaries for their support throughout this whole process. Kellie Casavale, she is one Co-executive Secretary. We look at her as the glue. Do you all agree? Can we give her a quick round of applause? She has been the glue in this whole process.

Ms. Rihane gave a huge thanks to the NIH meeting services staff for allowing use of all their wonderful facilities and providing us their state-of-the-art media support that allowed us to stream all these meetings across the web, across the globe. It was phenomenal to allow this transparent process to reach so many who could not be with us in person. Anne Rodgers is the

science writer and without her we could not have done it. She has been a great support with expertise and patience pulling the whole report together. And a huge thank you to all staff. I just hope that they know how much we appreciate them. It is the Data Analysis Team, the Nutrition Evidence Library Team, the Dietary Guidelines Management Team; we consider them the backbone. So just know that your report and information you pull together is just so important. So many people are waiting for the report from across the Federal Government, across the nation, and probably across the globe. So we thank you all very much and we look forward to seeing you again. I'll turn it over to Rick Olson, Designated Federal Officer for the Dietary Guidelines Advisory Committee.

Dr. Richard Olson thanked the Committee and noted it has been a great group to work with. He then adjourned the seventh and final meeting of the Dietary Guidelines Advisory Committee.